

## SEQUENCE LISTING

- <110> University of Florida and Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD)
- <120> Complete Biosynthetic Gene Set for Synthesis of Polyketide Antibiotics, Including the Albicidin Family, Resistance Genes, and Uses Thereof
- <130> UF-398XC1
- <150> US 60/419,463
- <151> 2002-10-18
- <160> 54
- <170> PatentIn version 3.1
- <210> 1
- <211> 55839
- <212> DNA
- <213> Xanthomonas albilineans

<400> 1

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&lt;211&gt; 9673

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 3

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&lt;213&gt; Xanthomonas albilineans

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&lt;210&gt; 6

&lt;211&gt; 1491

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 6

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&lt;210&gt; 7

&lt;211&gt; 954

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 7

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&lt;210&gt; 8

&lt;211&gt; 1356

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 8

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&lt;210&gt; 9

&lt;211&gt; 948

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 9

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 <213> Xanthomonas albilineans

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 <213> Xanthomonas albilineans

<400> 11

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 <212> DNA  
 <213> *Xanthomonas albilineans*

<400> 12

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<400> 13

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<210> 14  
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 <212> DNA  
 <213> *Xanthomonas albilineans*

<400> 14

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&lt;210&gt; 15

&lt;211&gt; 5880

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 15

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&lt;213&gt; Xanthomonas albilineans

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cgcaagatct	accatcgcat	cgacgacgcg	gcggcccgcg	tgctggacac	ctcttgcggtg	2040
cgcaacgata	gcttgctcga	aagtacgcgt	ttcatcgact	tctaccgcta	ctgcagtgtc	2100
agccgcaagg	acatgtatcg	ctatatcgcc	gagcgcgtag	gctggagccg	tccggctgac	2160
accggccgct	cgactaactg	cctgctcaac	gatgtgggca	tctacatgca	caagaagcaa	2220
cgtggctatc	acaactattc	gttgccctac	agttgggacg	tgcgggtagg	ccatatccca	2280
aggggaagacg	cgatgcgcga	gctggaggac	accgacgata	tagacgaggc	caaggtactg	2340
ggcctgctca	agcagatcgg	ctatgactca	agcctgatcg	ataccaggc	gggcgatgcg	2400
cagctgatcg	cctactactg	ggcggcggag	gaactggatc	cggtggcatt	gcgcaatttt	2460
gctgtgcga	tcttgcccga	gtacatgctg	ccttcgtatt	tcgtgcggct	ggaccgaatg	2520
ccgttgacgc	cgaatggcaa	ggtgaaccgc	cgagcattgc	cgaggccgga	gttgaagaag	2580
aacgccagcg	aggcgcatatc	cgagccgagc	agtgcgctag	agcaggaact	ggtgcaaatac	2640
tggaagagag	tgctgatggt	cgacaaggctc	ggcgtcaggg	acaacttttt	cgagctgggc	2700
ggccactcgc	tgagcgcgct	gatgttgctc	tacagcatag	ccgagcgcta	ccagaagatg	2760
gtcagcatcc	aggcattctc	ggttaatccg	accatcgaag	gtctgtcgga	gcattctggtc	2820
gcataa						2826

&lt;210&gt; 24

&lt;211&gt; 837

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 24

atgcccgaatg	ccgtaccgat	gcaggggcgcg	cggggactcc	cgagcccgca	agcgatgaac	60
ccagggttgc	cgagcgctcg	cggtttgagc	gcaggccagc	cattgcagtt	gtcgtagca	120
ccggaactgc	aggcagccgc	gcgcagtgc	caccgccatc	tgctcgacga	cggcacggcg	180
ctttacctgc	tggtcggtcg	taccgcgcaa	ttcgaccggg	gggttttcgc	ggcaatggca	240
atcgcccgcc	cgacagcat	cgcccgagc	gtgcgcaagc	gtcaggccga	gttcctgttc	300
ggcgtctgg	ccgcgcgact	ggcgctgcaa	gaggtgctgg	gacctgcgca	agcgcaggca	360
gacattgcaa	tcggcgcgac	gcgcgcgccc	tgctggcctg	ccggcagcct	gggcagcatt	420
tccattgctg	aggactacgc	ggccgccatc	gccatggcgg	ccggcaccgc	ccacggcggtg	480
ggcatcgatc	tggaacgacc	aatcacacc	gcggcgcgcg	cggcgttgct	gagcatcgca	540
atcgatgccg	acgaagccgc	tcgtctggca	aaggcgagc	acgcgcagtg	gccgcaagac	600
ctgctgctga	ccgcactatt	ttcggccaa	gaaagcctgt	tcaaagccgc	ctacagcgcg	660
gtcggacgct	acttcgactt	cagcgcgga	cgccgtgtgc	gcacgcacct	ggcacggcaa	720
tgcttgcac	tgcgccctgac	cgagacactc	tgcgcgcaat	tcgtggcccg	gcaagtgtgc	780
gaggtcggct	tcgcgcgcct	accaccggac	ctggtgctca	cccactacgc	ctggtga	837

&lt;210&gt; 25

&lt;211&gt; 1905

&lt;212&gt; DNA

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 25

atgagcgtgg	aaacccaaaa	agaaaccctg	ggctttcaga	ccgaggtcaa	acagctgctg	60
cagctgatga	tccattcggt	gtattccaac	aaggagatct	tcctgcgcga	gctgatctcc	120
aatgcctccg	acgcggccga	caaactgcgc	ttcgaggcac	tggtcaagcc	ggaacttctg	180
gacggcgatg	cgcaactgcg	catccgcatac	ggcttcgaca	aggacgcgg	caccgtcacc	240
atcgacgaca	acggcatcgg	catgagccgc	gaggagatcg	tcgcgcacct	gggcaccatc	300
gccaaatccg	gcacctccga	tttccctcaag	catctgtccg	gcgatcagaa	gaaggattcg	360
cacctgatcg	gccagttcgg	tgctggcttc	tacagtgcct	tcacgtctgc	cgatcaagtg	420
gacgtgtaca	gccgtcgcgc	cggtctgcgc	gccagcgacg	gcgtacactg	gtcctcgcg	480
ggcgaaggcg	agttcgagg	cgccaccatc	gacaagcccg	agcgcggcac	ccgcacgtg	540
ctgcacttga	aggaggaaga	gaaaggcttc	gccgacgggt	ggaagtgtcg	cagcatcggtg	600
cgcaagtact	ccgaccacat	cgccttgccg	atcgagctaa	tcaagggaaca	ctacggcgag	660
gacaaggaca	agccggaaac	ccccgagtg	gagaccgtca	atcgcgccag	cgcgtgtg	720
acacggccgc	gcaccgagat	caaggacgag	gaataccaag	aactgtacaa	gcacattgcc	780
cacgaccacg	aaaaccgggt	ggcgtggagc	cataacaagg	tcgaaggcaa	actggaatac	840

```

acctcgctgc tgtacctgcc cggccgcgcc ccgttcgacc tgtaccagcg cgatgcctcg      900
cgcggggctca agctgtacgt gcagcgcgtc ttcatcatgg accaggccga ccaattcctg      960
ccgctgtacc tgcgcttcac caagggcatc gtcgattcca gcgacctgcc gctgaacgtc     1020
tcgcgcgaaa tcctgcaatc tgggccggtg atcgactcga tgaagtcggc gctgaccaag     1080
cgcgcaactgg acatgctgga aaagctcgcc aaagacgata ccgaacgcta caagggcgtg     1140
tggaagaact tcggccaggt gctgaaggaa ggtccggccc aggacttcgg caaccgcgaa     1200
aagatcgccg gcctgctgcg cttcgcgtcc acccacagcg gcgacgacgc ccagaacgtg     1260
tcgctggccg actacgtggc gcggatgaaa gacggccagg acaagctgta ctacctgacc     1320
ggggaaagct acgcgcaaat caaggacagc ccgcacctgg aggtgttccg caagaagggc     1380
atcgaggtgc tcctgctcac cgaccgcatc gacgagtggc tgatgagcta tctcaccgag     1440
ttcgacagca aatccttcgt cgatgtggcg cgcggcgacc tggacctggg caagctggac     1500
agcgaagaag aaaagcaggc gcaggaagaa gcccgcaagg ccaagcaagg gctggccgag     1560
cgcatccagc aggtactcaa ggacgaggtc gccgaggtgc gggctctcgca ccggctgacc     1620
gattcgccgg cgattcttgc catcgccagc ggcgacatgg gtctgcaaat gcggcagatc     1680
ctggaagcca gcgggcagaa gctgccggag agcaagccgg tgttcgagtt caaccccgcg     1740
catccgctga tcgagaaact ggatgcggaa cccgatgtcg atcgtttcgg tgatctggcg     1800
cgggtgctgt tcgatcaggc cgcgctggcc gccggcgaca gcctcaagga cccggccgcc     1860
tacgtgcgtc ggctcaacaa gctgttgctg gagctgtcgg cgtaa                      1905

```

&lt;210&gt; 26

&lt;211&gt; 6879

&lt;212&gt; PRT

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 26

```

Met Pro Asn Ala Leu Met Gln Ile Thr Leu Val Ala Val Gln Phe Ala
1           5           10           15

```

```

Gly Val Leu Leu Gly Val Thr Ala Arg Ala Ala Ile Pro Asn Lys Ala
20           25           30

```

```

Gly Met Arg Arg Ala Trp Pro Pro Phe Pro Gln Ala Cys Cys Arg Ser
35           40           45

```

```

Ile Ala Tyr Leu Met Gln Arg Ser Pro Met Ser Pro Leu Gln Gln Thr
50           55           60

```

```

Leu Leu Thr Arg Leu Ala Ser Ala Ala Ala Ser Arg Thr Met Ile Glu
65           70           75           80

```

```

Phe Pro Arg Pro Glu His Ala Ser Pro Gln Cys Cys Asp Asp Ala Glu
85           90           95

```

```

Leu Ala Arg Leu Ile Val Gln Leu Ser Ala Gly Leu Gln Pro Leu Ala
100          105          110

```

```

Met Pro Gly Thr Tyr Val Ile Ile Ala Ala Pro His Gly Gly Leu Phe
115          120          125

```

```

Ala Ala Ala Leu Leu Ala Cys Leu His Ala Asn Leu Val Ala Val Pro
130          135          140

```

```

Phe Pro Leu Asp Val Ala Gln Pro Asn Glu Arg Glu Gln Ala Arg Leu
145          150          155          160

```

```

Glu Thr Ile His Ala Gln Leu Met Glu His Gly Asn Val Ala Val Leu
165          170          175

```

```

Leu Asp Asp Val Ala Asp Arg Ser Ala Phe Ala Arg Met Ala His Ala

```

180					185					190						
Ala	Gly	Thr	Phe	Leu	Ala	Thr	Phe	Ala	Asp	Leu	Lys	Arg	Glu	Ser	Thr	
195					200					205						
Ser	Ala	Ser	Leu	Cys	Pro	Ala	Ser	Pro	Ser	Asp	Ala	Ala	Leu	Leu	Leu	
210					215					220						
Phe	Thr	Ser	Gly	Ser	Ser	Gly	Glu	Ser	Lys	Gly	Ile	Leu	Leu	Ser	His	
225					230					235					240	
Arg	Asn	Leu	His	His	Gln	Ile	Gln	Ala	Gly	Ile	Arg	Gln	Trp	Ser	Leu	
245					250					255						
Asp	Glu	His	Ser	His	Val	Val	Thr	Trp	Leu	Ser	Pro	Ala	His	Asn	Phe	
260					265					270						
Gly	Leu	His	Phe	Gly	Leu	Leu	Ala	Pro	Trp	Phe	Ser	Gly	Ala	Thr	Val	
275					280					285						
Ser	Phe	Ile	His	Pro	His	Ser	Tyr	Met	Lys	Arg	Pro	Gly	Phe	Trp	Leu	
290					295					300						
Glu	Thr	Val	Ala	Ala	Arg	Asp	Ala	Thr	His	Met	Ala	Ala	Pro	Asn	Phe	
305					310					315					320	
Ala	Phe	Asp	Tyr	Cys	Cys	Asp	Trp	Val	Met	Val	Glu	Gln	Leu	Pro	Pro	
325					330					335						
Ser	Ala	Leu	Ser	Thr	Leu	Thr	His	Ile	Val	Cys	Gly	Gly	Glu	Pro	Val	
340					345					350						
Arg	Ala	Ser	Thr	Met	Gln	Arg	Phe	Phe	Glu	Lys	Phe	Ala	Gly	Leu	Gly	
355					360					365						
Ala	Arg	Thr	Gln	Thr	Phe	Met	Pro	His	Phe	Gly	Leu	Ser	Glu	Thr	Gly	
370					375					380						
Ala	Leu	Ser	Thr	Leu	Asp	Glu	Ala	Pro	Gln	Gln	Arg	Val	Leu	Glu	Leu	
385					390					395					400	
Asp	Ala	Asp	Ala	Leu	Asn	Lys	Arg	Lys	Arg	Val	Ala	Ala	Gly	Ala	Ser	
405					410					415						
Gln	Ala	Arg	Val	Thr	Val	Leu	Asn	Cys	Gly	Ala	Val	Asp	Gln	Asp	Val	
420					425					430						
Glu	Leu	Arg	Ile	Val	Cys	Pro	Glu	Gly	Glu	Thr	Leu	Cys	Arg	Pro	Asp	
435					440					445						
Glu	Ile	Gly	Glu	Ile	Trp	Val	Lys	Ser	Pro	Ala	Ile	Ala	Arg	Gly	Tyr	
450					455					460						
Leu	Phe	Ala	Lys	Pro	Ala	Asp	Gln	Arg	Gln	Phe	Asn	Cys	Ser	Ile	Arg	
465					470					475					480	
His	Thr	Asp	Asp	Ser	Gly	Tyr	Phe	Arg	Thr	Gly	Asp	Leu	Gly	Phe	Ile	
485					490					495						
Ala	Asp	Gly	Cys	Leu	Tyr	Val	Thr	Gly	Arg	Val	Lys	Glu	Val	Leu	Ile	
500					505					510						

Ile Arg Gly Lys Asn His Tyr Pro Ala His Ile Glu Ala Ser Ile Ala  
 515 520 525  
 Ala Thr Ala Ser Pro Gly Ala Leu Met Pro Val Val Phe Ser Ile Glu  
 530 535 540  
 Arg Gln Asp Glu Glu Arg Val Ala Ala Val Ile Ala Val Asn His Pro  
 545 550 555 560  
 Trp Thr Pro Ala Ala Cys Ala Ala Gln Ala His Lys Ile Arg Gln Gln  
 565 570 575  
 Val Ala Asp Gln His Gly Val Ala Leu Ala Glu Leu Ala Phe Ala Glu  
 580 585 590  
 His Arg His Val Phe Gly Thr Tyr Pro Gly Lys Leu Lys Arg Arg Leu  
 595 600 605  
 Val Lys Glu Ala Tyr Val Asn Gly Gln Leu Pro Leu Leu Trp His Glu  
 610 615 620  
 Gly Lys Asn Arg Asp Val Pro Ala Ala Ala Ala Asp Asp Arg Gln Ala  
 625 630 635 640  
 Gln His Val Ala Asp Leu Cys Arg Lys Val Phe Leu Pro Val Leu Gly  
 645 650 655  
 Val Ala Pro Pro His Ala Gln Trp Pro Leu Cys Glu Leu Ala Leu Asp  
 660 665 670  
 Ser Leu Gln Cys Val Arg Leu Ala Gly Ala Ile Glu Glu Cys Tyr Gly  
 675 680 685  
 Val Pro Phe Glu Pro Thr Leu Leu Phe Lys Leu Glu Thr Val Gly Ala  
 690 695 700  
 Ile Ala Glu Tyr Val Leu Ala His Gly Arg Gln Ala Pro Thr Pro Thr  
 705 710 715 720  
 Arg Ala Pro Val Ala Ser Thr Thr Cys Ser Glu Glu Pro Ile Ala Ile  
 725 730 735  
 Val Ala Met His Cys Glu Val Pro Gly Ala Gly Glu Asn Thr Glu Ala  
 740 745 750  
 Leu Trp Ser Phe Leu Arg Ser Asp Val Asn Ala Ile Arg Pro Ile Glu  
 755 760 765  
 Ser Thr Arg Pro Asp Leu Trp Ala Ala Met Arg Ala Tyr Pro Gly Leu  
 770 775 780  
 Ala Gly Glu Gln Leu Pro Arg Tyr Ala Gly Phe Leu Asp Asp Val Asp  
 785 790 795 800  
 Ala Phe Asp Ala Ala Phe Phe Gly Ile Ser Arg Arg Glu Ala Glu Cys  
 805 810 815  
 Met Asp Pro Gln Gln Arg Lys Val Leu Glu Met Val Trp Lys Leu Ile  
 820 825 830  
 Glu Gln Ala Gly His Asp Pro Leu Ser Trp Gly Gly Gln Pro Val Gly

835					840					845					
Leu	Phe	Val	Gly	Ala	His	Thr	Ser	Asp	Tyr	Gly	Glu	Leu	Leu	Ala	Ser
850						855					860				
Gln	Pro	Gln	Leu	Met	Ala	Gln	Cys	Gly	Ala	Tyr	Ile	Asp	Ser	Gly	Ser
865					870					875					880
His	Leu	Thr	Met	Ile	Pro	Asn	Arg	Ala	Ser	Arg	Trp	Phe	Asn	Phe	Thr
				885					890					895	
Gly	Pro	Ser	Glu	Val	Ile	Asn	Ser	Ala	Cys	Ser	Ser	Ser	Leu	Val	Ala
			900					905					910		
Leu	His	Arg	Ala	Val	Gln	Ser	Leu	Arg	Gln	Gly	Glu	Ser	Ser	Val	Ala
			915				920					925			
Leu	Val	Leu	Gly	Val	Asn	Leu	Ile	Leu	Ala	Pro	Lys	Val	Leu	Leu	Ala
			930			935					940				
Ser	Ala	Ser	Ala	Gly	Met	Leu	Ser	Pro	Asp	Gly	Arg	Cys	Lys	Thr	Leu
945					950					955					960
Asp	Ala	Ala	Ala	Asp	Gly	Phe	Val	Arg	Ser	Glu	Gly	Ile	Ala	Gly	Val
				965					970					975	
Ile	Leu	Lys	Pro	Leu	Ala	Gln	Ala	Leu	Ala	Asp	Gly	Asp	Arg	Val	Tyr
			980					985					990		
Gly	Leu	Val	Arg	Gly	Val	Ala	Val	Asn	His	Gly	Gly	Arg	Ser	Asn	Ser
			995				1000					1005			
Leu	Arg	Ala	Pro	Asn	Val	Asn	Ala	Gln	Arg	Gln	Leu	Leu	Ile	Arg	
	1010					1015					1020				
Thr	Tyr	Gln	Glu	Ala	Gly	Val	Glu	Pro	Ala	Ser	Val	Gly	Tyr	Val	
	1025					1030					1035				
Glu	Leu	His	Gly	Thr	Gly	Thr	Ser	Leu	Gly	Asp	Pro	Ile	Glu	Ile	
	1040					1045					1050				
Gln	Ala	Leu	Lys	Glu	Ala	Phe	Ile	Ala	Leu	Gly	Ala	Gln	Ala	Ala	
	1055					1060					1065				
Pro	Ser	Asn	Cys	Gly	Ile	Gly	Ser	Val	Lys	Ser	Ala	Leu	Gly	His	
	1070					1075					1080				
Leu	Glu	Ala	Ala	Ala	Gly	Leu	Thr	Gly	Leu	Ile	Lys	Val	Leu	Leu	
	1085					1090					1095				
Met	Leu	Lys	His	Gly	Glu	Gln	Ala	Gly	Thr	Arg	His	Phe	Ser	Thr	
	1100					1105					1110				
Leu	Asn	Pro	Leu	Ile	Asp	Leu	Arg	Gly	Thr	Ser	Phe	Glu	Val	Val	
	1115					1120					1125				
Ala	Gln	His	Arg	Ala	Trp	Pro	Ser	Gln	Val	Gly	Ile	His	Gly	Thr	
	1130					1135					1140				
Leu	Leu	Pro	Arg	Arg	Ala	Gly	Ile	Ser	Ser	Phe	Gly	Phe	Gly	Gly	
	1145					1150					1155				



Ala Asn	Ala His	Ala Ile	Val	Glu Glu	His Val	Ile	Ala Thr	Pro	
1160			1165			1170			
Pro Ser	Thr Ser	Ser Ala	Gly	Gly Pro	Val Gly	Ile	Val Leu	Ser	
1175			1180			1185			
Ala Gly	Ser Glu	Ala Val	Leu	Arg Gln	Gln Val	Leu	Ala Leu	Ser	
1190			1195			1200			
Ala Trp	Leu Arg	Gln Gln	Ser	Pro Thr	Pro Ala	Gln	Met Ile	Asp	
1205			1210			1215			
Val Ala	Tyr Thr	Leu Gln	Val	Gly Arg	Ala Ala	Leu	Ser His	Arg	
1220			1225			1230			
Leu Ala	Phe Ser	Ala Thr	Asp	Ala Glu	Gln Ala	Leu	Ala Arg	Leu	
1235			1240			1245			
Glu Gly	Arg Leu	Ala Gly	Val	Met Asp	Ala Glu	Val	His His	Gly	
1250			1255			1260			
Val Val	Asp Ala	Ala Ala	Thr	Ala Pro	Glu His	Gly	Arg Gln	Thr	
1265			1270			1275			
Arg Glu	Gly Leu	Ala Gly	Leu	Leu Arg	Ala Trp	Thr	Gln Gly	Val	
1280			1285			1290			
Arg Val	Asp Trp	Ser Ala	Leu	Tyr Gly	Ile Gln	Arg	Pro Gln	Arg	
1295			1300			1305			
Val Ser	Leu Pro	Val Tyr	Pro	Phe Ala	Arg Glu	Arg	Tyr Trp	Leu	
1310			1315			1320			
Pro Gly	Gln Ala	Met His	Ala	Ala Ala	Asp Ala	His	Pro Met	Leu	
1325			1330			1335			
Gln Leu	Leu His	Ala Asn	Ala	Lys Leu	His Arg	Tyr	Ala Leu	Arg	
1340			1345			1350			
Arg Ser	Gly Cys	Ala Ser	Phe	Leu Val	Asp His	Cys	Val Asp	Gly	
1355			1360			1365			
Arg Gln	Val Leu	Pro Ala	Ala	Val Gln	Leu Glu	Leu	Val Arg	Ala	
1370			1375			1380			
Val Ala	Gln Arg	Val Met	Ala	Gln Asp	Glu Gly	Cys	Ile Glu	Leu	
1385			1390			1395			
Ala Gln	Val Ala	Phe Leu	His	Pro Leu	Met Met	Glu	Glu Thr	Glu	
1400			1405			1410			
Leu Glu	Val Glu	Ile Glu	Leu	Ser Lys	Ser Asp	Gln	Asp Glu	Phe	
1415			1420			1425			
Asp Phe	Gln Leu	His Asp	Ala	His Arg	Gln Gln	Val	Phe Ser	Gln	
1430			1435			1440			
Gly His	Val Arg	Arg Arg	Val	Tyr Thr	Ala Thr	Pro	Arg Leu	Asp	
1445			1450			1455			
Leu Ala	Gln Leu	Gln Lys	Leu	Cys Ala	Glu Arg	Val	Leu Ser	Gly	

1460	1465	1470
Glu Asp Cys Tyr Ala His Phe Thr Ala Cys Gly Leu Gln Leu Gly 1475 1480 1485		
Asp Arg Leu Lys Ser Val Gln Ser Ile Gly Cys Gly Arg Asn Gly 1490 1495 1500		
Glu Gly Glu Pro Ile Ala Leu Gly Val Leu Arg Leu Pro Pro Ser 1505 1510 1515		
Ser Val Glu Asp Ser His Val Leu Pro Pro Ser Leu Leu Asp Gly 1520 1525 1530		
Ala Leu Gln Cys Ser Leu Gly Leu Gln Arg Asp Val Glu His Ile 1535 1540 1545		
Ala Met Pro Tyr Thr Leu Glu Arg Met Thr Val His Ala Pro Ile 1550 1555 1560		
Pro Pro Glu Ala Trp Val Leu Leu Arg His Gly His Ala Ala Arg 1565 1570 1575		
Gln Ser Leu Asp Ile Asp Leu Leu Asp Ser Glu Gly Arg Val Cys 1580 1585 1590		
Val Ser Leu Gly Asn Tyr Thr Gly Arg Ala Pro Lys Ala Val Ser 1595 1600 1605		
Ala Val Arg Ala Leu Val Leu Ala Pro Val Trp Gln Ala Leu Thr 1610 1615 1620		
Glu Thr Ala Pro Ala Trp Pro Asp Pro Ala Glu Arg Ile Val Thr 1625 1630 1635		
Val Gly Asp Asp Ala Trp Arg Ser His Phe Gly Phe Asp Glu Pro 1640 1645 1650		
Ala Leu Ser Leu Glu Asp Ser Val Glu Val Ile Ala Thr Arg Leu 1655 1660 1665		
Gly Gln Ser Gly Lys Phe Asp His Leu Val Trp Ile Val Pro Ile 1670 1675 1680		
Ala Glu Ser Glu Thr Asp Ile Ala Ala Gln Gly Ser Ala Ala Ile 1685 1690 1695		
Ala Gly Phe Arg Leu Val Lys Ala Leu Leu Ala Leu Gly Tyr Ala 1700 1705 1710		
His Arg Pro Leu Gly Leu Thr Val Leu Thr Arg Gln Ala Leu Thr 1715 1720 1725		
Arg Gln Pro Ser His Ala Ala Val His Gly Leu Ile Gly Thr Leu 1730 1735 1740		
Ala Lys Glu Tyr Cys Asn Trp Lys Ile Arg Leu Leu Asp Leu Pro 1745 1750 1755		
Ser Val Lys Ser Trp Pro Gln Trp Glu Gln Leu Arg Ser Leu Pro 1760 1765 1770		

Trp	His	Ala	Gln	Gly	Glu	Ala	Leu	Ile	Gly	Arg	Gly	Thr	Cys	Trp
1775						1780					1785			
Tyr	Arg	Arg	Gln	Leu	Cys	Glu	Val	Leu	Pro	Leu	Pro	Ser	Leu	Glu
1790						1795					1800			
Pro	Pro	Pro	Tyr	Arg	Val	Gly	Gly	Val	Tyr	Val	Val	Ile	Gly	Gly
1805						1810					1815			
Ala	Gly	Gly	Leu	Gly	Glu	Val	Leu	Ser	Glu	His	Leu	Ile	Arg	Thr
1820						1825					1830			
Tyr	Asp	Ala	Gln	Leu	Ile	Trp	Ile	Gly	Arg	Arg	Val	Leu	Asp	Glu
1835						1840					1845			
Gly	Ile	Ala	Arg	Lys	Gln	Thr	Arg	Leu	Ala	Ser	Leu	Gly	Arg	Ala
1850						1855					1860			
Pro	His	Tyr	Ile	Ser	Ala	Asp	Ala	Ser	Asp	Pro	Ala	Ala	Leu	Gln
1865						1870					1875			
Ala	Ala	His	Asn	Glu	Ile	Val	Ala	Leu	His	Gly	Gln	Pro	His	Gly
1880						1885					1890			
Leu	Ile	Leu	Ser	Asn	Ile	Val	Leu	Lys	Asp	Ala	Ser	Leu	Ala	Arg
1895						1900					1905			
Met	Glu	Glu	Ala	Asp	Phe	Arg	Asp	Val	Leu	Ala	Ala	Lys	Leu	Asp
1910						1915					1920			
Val	Ser	Val	Cys	Ala	Ala	Gln	Val	Phe	Gly	Thr	Ala	Pro	Leu	Asp
1925						1930					1935			
Phe	Val	Leu	Phe	Phe	Ser	Ser	Ile	Gln	Ser	Thr	Thr	Lys	Ala	Ala
1940						1945					1950			
Gly	Gln	Gly	Asn	Tyr	Ala	Ala	Gly	Cys	Cys	Tyr	Val	Asp	Ala	Phe
1955						1960					1965			
Gly	Glu	Leu	Trp	Ala	Arg	Arg	Gly	Leu	Arg	Val	Lys	Thr	Ile	Asn
1970						1975					1980			
Trp	Gly	Tyr	Trp	Gly	Ser	Val	Gly	Val	Val	Ala	Gly	Glu	Asp	Tyr
1985						1990					1995			
Arg	Arg	Arg	Met	Ala	Gln	Lys	His	Met	Ala	Ser	Ile	Glu	Gly	Ala
2000						2005					2010			
Glu	Ala	Met	Gln	Val	Leu	Ser	Gln	Leu	Leu	Cys	Ala	Pro	Leu	Gln
2015						2020					2025			
Arg	Leu	Ala	Tyr	Val	Lys	Ile	Asp	Asp	Ala	Asn	Ala	Met	Arg	Ala
2030						2035					2040			
Leu	Gly	Val	Val	Glu	Asp	Glu	Ser	Val	Gln	Ile	Pro	Val	His	Ala
2045						2050					2055			
Pro	Ala	Glu	Pro	Pro	Arg	Gly	Gln	Pro	Gly	Pro	Val	Val	Glu	Leu
2060						2065					2070			

Ser	Val	Asn	Leu	Asp	Ala	Arg	Arg	Glu	Arg	Glu	Thr	Leu	Leu	Ala
2075						2080					2085			
Ala	Trp	Leu	Leu	Glu	Leu	Ile	Glu	Gln	Leu	Gly	Gly	Phe	Pro	Pro
2090						2095					2100			
Ala	Ser	Phe	Asp	Ile	Ala	Thr	Leu	Ala	Gln	Arg	Leu	His	Ile	Val
2105						2110					2115			
Pro	Ala	Tyr	Arg	Ser	Trp	Leu	Glu	His	Ser	Val	Arg	Met	Leu	Gly
2120						2125					2130			
Val	Tyr	Gly	Tyr	Leu	Arg	Ala	Thr	Gly	Glu	Ser	Arg	Phe	Glu	Leu
2135						2140					2145			
Ala	Asp	Lys	Pro	Pro	Asp	Asp	Ala	Arg	Gly	Ala	Trp	Asn	Ala	His
2150						2155					2160			
Val	His	Glu	Ala	Ser	Val	Glu	Ala	Gly	Glu	Glu	Ala	Gln	Arg	Arg
2165						2170					2175			
Leu	Leu	Asp	Arg	Cys	Met	Arg	Ala	Leu	Pro	Ala	Val	Leu	Arg	Gly
2180						2185					2190			
Glu	Arg	Lys	Ala	Thr	Glu	Leu	Leu	Phe	Pro	Glu	Gly	Ser	Met	Ala
2195						2200					2205			
Trp	Val	Glu	Gly	Ile	Tyr	Gln	Asn	Asn	Pro	Leu	Ala	Asp	Tyr	Phe
2210						2215					2220			
Asn	Ala	Gln	Leu	Val	Thr	Arg	Leu	Ile	Ala	Tyr	Leu	Arg	Arg	Arg
2225						2230					2235			
Leu	Glu	Ser	Thr	Pro	Thr	Ala	Arg	Leu	Lys	Leu	Cys	Glu	Ile	Gly
2240						2245					2250			
Ala	Gly	Ser	Gly	Gly	Thr	Thr	Ala	Ser	Val	Leu	Gln	Gln	Leu	Gln
2255						2260					2265			
Ala	Tyr	Gly	Glu	His	Ile	Glu	Glu	Tyr	Leu	Tyr	Thr	Asp	Leu	Ser
2270						2275					2280			
Pro	Val	Phe	Leu	His	His	Ala	Glu	Lys	His	Tyr	Gln	Pro	Arg	Ala
2285						2290					2295			
Pro	Tyr	Leu	Arg	Thr	Ala	Cys	Phe	Asp	Val	Ala	Arg	Ala	Pro	Thr
2300						2305					2310			
Ala	Gln	Ala	Leu	Glu	Ser	Gly	Gly	Tyr	Asp	Val	Val	Ile	Ala	Ala
2315						2320					2325			
Asn	Val	Leu	His	Ala	Thr	Arg	Asp	Ile	Ala	Lys	Thr	Leu	Arg	Asn
2330						2335					2340			
Ala	Lys	Ala	Leu	Leu	Lys	Pro	Gly	Gly	Leu	Leu	Leu	Leu	Asn	Glu
2345						2350					2355			
Val	Ile	Glu	Arg	Ser	Leu	Val	Leu	His	Leu	Thr	Phe	Gly	Leu	Leu
2360						2365					2370			
Glu	Ser	Trp	Trp	Leu	Pro	Gln	Asp	Lys	Ile	Leu	Arg	Leu	Ala	Gly

2375	2380	2385
Ser Pro Leu Leu Ala Cys	Ala Thr Trp Arg Ser	Leu Leu Glu Ala
2390	2395	2400
Glu Gly Phe Ala Gly Leu	Ser Val His Arg Ala	Gln Pro Asp Ala
2405	2410	2415
Gly Gln Ala Ile Ile Cys	Ala Tyr Ser Asp Gly	Ile Val Arg Gln
2420	2425	2430
Ala Ser Thr Ile Glu Val	Ala Arg Asn Glu Lys	Val Thr Val Pro
2435	2440	2445
Ser Gln Pro Ala Glu Ala	Gly Glu Ser Pro Leu	Asp Leu Val Lys
2450	2455	2460
Lys Leu Leu Gly Arg Ile	Leu Lys Met Asp Pro	Ala Thr Leu Asp
2465	2470	2475
Thr Ser His Pro Leu Glu	Tyr Tyr Gly Val Asp	Ser Ile Val Ala
2480	2485	2490
Ile Glu Leu Ala Met Ala	Leu Arg Glu Thr Phe	Pro Gly Phe Glu
2495	2500	2505
Val Ser Glu Leu Phe Glu	Thr Gln Ser Ile Asp	Thr Leu Leu Gly
2510	2515	2520
Ser Leu Glu Gln Ala Pro	Leu Leu Ala Thr Leu	Thr Ala Pro Pro
2525	2530	2535
Gln Gln Asp Met Leu Gln	Gln Leu Lys Gln Leu	Leu Ala Arg Thr
2540	2545	2550
Leu Lys Leu Asp Ile Thr	Gln Ile Asp Thr Ser	Lys Thr Leu Glu
2555	2560	2565
Ser Tyr Gly Val Asp Ser	Ile Val Ile Ile Glu	Leu Ala Asn Ala
2570	2575	2580
Leu Arg Glu Arg Tyr Pro	Ser Leu Asp Ala Ser	Gln Leu Met Glu
2585	2590	2595
Thr Leu Ser Ile Asp Arg	Leu Val Ala Gln Trp	Gln Ala Thr Glu
2600	2605	2610
Pro Ala Val Pro Ala Glu	Pro Thr Ala Glu Pro	Pro Val Ala Asp
2615	2620	2625
Glu Asp Ala Ala Ala Ile	Ile Gly Leu Ala Gly	Arg Phe Pro Gly
2630	2635	2640
Ala Asp Thr Leu Glu Glu	Phe Trp Asn Asn Leu	Arg Asn Gly Gln
2645	2650	2655
Ser Ser Met Gly Glu Val	Pro Gly Glu Arg Trp	Asp His Gln His
2660	2665	2670
Tyr Phe Asp Ser Glu Arg	Gln Ala Pro Gly Lys	Thr Tyr Ser Arg
2675	2680	2685

Trp	Gly	Ala	Phe	Leu	Arg	Asp	Ile	Asp	Gly	Phe	Asp	Ala	Ala	Phe
2690						2695					2700			
Phe	Glu	Trp	Pro	Asp	Ser	Val	Ala	Leu	Glu	Ser	Asp	Pro	Gln	Ala
2705						2710					2715			
Arg	Ile	Phe	Leu	Glu	Gln	Ala	Tyr	Ala	Gly	Ile	Glu	Asp	Ala	Gly
2720						2725					2730			
Tyr	Thr	Pro	Gly	Ser	Leu	Ser	Lys	Ser	Gln	Arg	Val	Gly	Val	Phe
2735						2740					2745			
Val	Gly	Val	Met	Asn	Gly	Tyr	Tyr	Ser	Gly	Gly	Ala	Arg	Phe	Trp
2750						2755					2760			
Gln	Ile	Ala	Asn	Arg	Val	Ser	Tyr	Gln	Phe	Asp	Phe	Arg	Gly	Pro
2765						2770					2775			
Ser	Leu	Ala	Val	Asp	Thr	Ala	Cys	Ser	Ala	Ser	Leu	Thr	Ala	Ile
2780						2785					2790			
His	Leu	Ala	Leu	Glu	Ser	Leu	Arg	Ser	Gly	Ser	Cys	Glu	Val	Ala
2795						2800					2805			
Leu	Ala	Gly	Gly	Val	Asn	Leu	Leu	Val	Asp	Pro	Gln	Gln	Tyr	Leu
2810						2815					2820			
Asn	Leu	Ala	Gly	Ala	Ala	Met	Leu	Ser	Ala	Gly	Ala	Ser	Cys	Arg
2825						2830					2835			
Pro	Phe	Gly	Glu	Ala	Ala	Asp	Gly	Phe	Val	Ala	Gly	Glu	Ala	Cys
2840						2845					2850			
Gly	Val	Val	Leu	Leu	Lys	Pro	Leu	Lys	Gln	Ala	Arg	Ala	Asp	Gly
2855						2860					2865			
Asp	Val	Ile	His	Ala	Val	Ile	Arg	Gly	Ser	Met	Ile	Asn	Ala	Gly
2870						2875					2880			
Gly	His	Thr	Ser	Ala	Phe	Ser	Ser	Pro	Asn	Pro	Ala	Ala	Gln	Ala
2885						2890					2895			
Glu	Val	Val	Arg	Gln	Ala	Leu	Gln	Arg	Ala	Gly	Val	Ala	Pro	Asp
2900						2905					2910			
Ser	Ile	Ser	Tyr	Ile	Glu	Ala	His	Gly	Thr	Gly	Thr	Val	Leu	Gly
2915						2920					2925			
Asp	Ala	Val	Glu	Leu	Gly	Ala	Leu	Asn	Lys	Val	Phe	Asp	Lys	Arg
2930						2935					2940			
Ala	Ala	Pro	Cys	Pro	Ile	Gly	Ser	Leu	Lys	Ala	Asn	Ile	Gly	His
2945						2950					2955			
Ala	Glu	Ser	Ala	Ala	Gly	Ile	Ala	Gly	Leu	Ala	Lys	Leu	Val	Leu
2960						2965					2970			
Gln	Phe	Arg	His	Gly	Glu	Leu	Val	Pro	Ser	Leu	Asn	Ala	Phe	Pro
2975						2980					2985			



Leu	Asn	Pro	Tyr	Ile	Glu	Phe	Gly	Arg	Phe	Gln	Val	Gln	Gln	Gln
2990						2995					3000			
Pro	Ala	Pro	Trp	Pro	Arg	Arg	Gly	Ala	Gln	Pro	Arg	Arg	Ala	Gly
3005						3010					3015			
Leu	Ser	Ala	Phe	Gly	Ala	Gly	Gly	Ser	Asn	Ala	His	Leu	Val	Val
3020						3025					3030			
Glu	Glu	Ala	Pro	Ala	Met	Ala	Pro	Gly	Val	Ser	Ile	Ser	Ala	Ser
3035						3040					3045			
Ser	Pro	Ala	Leu	Ile	Val	Leu	Ser	Ala	Arg	Thr	Leu	Pro	Ala	Leu
3050						3055					3060			
Gln	Gln	Arg	Ala	Arg	Asp	Leu	Leu	Val	Trp	Met	Gln	Ala	Arg	Gln
3065						3070					3075			
Val	Asp	Asp	Val	Met	Leu	Ala	Asp	Val	Ala	Tyr	Thr	Leu	His	Leu
3080						3085					3090			
Gly	Arg	Val	Ala	Met	Glu	Gln	Arg	Leu	Ala	Phe	Thr	Ala	Gly	Ser
3095						3100					3105			
Ala	Ala	Glu	Leu	Ser	Glu	Lys	Leu	Gln	Ala	Tyr	Leu	Gly	His	Ala
3110						3115					3120			
Ile	Arg	Ala	Asp	Ile	Tyr	Leu	Ser	Glu	Asp	Thr	Pro	Gly	Lys	Pro
3125						3130					3135			
Ala	Gly	Ala	Pro	Ile	Val	Ala	Glu	Glu	Asp	Leu	Leu	Thr	Leu	Met
3140						3145					3150			
Asp	Ala	Trp	Ile	Glu	Lys	Gly	Gln	Tyr	Gly	Arg	Leu	Leu	Gly	Tyr
3155						3160					3165			
Trp	Thr	Lys	Gly	Gln	Pro	Ile	Asp	Trp	Asn	Lys	Leu	Tyr	Trp	Arg
3170						3175					3180			
Lys	Leu	Tyr	Ala	Asp	Gly	Arg	Pro	Arg	Arg	Ile	Ser	Leu	Pro	Thr
3185						3190					3195			
Tyr	Pro	Phe	Glu	His	Arg	Arg	Tyr	Trp	Gln	Thr	Pro	Val	Pro	Gly
3200						3205					3210			
Glu	Arg	Ser	Leu	His	Ala	Thr	Ala	Pro	Ala	Thr	Arg	Glu	Thr	Val
3215						3220					3225			
Ala	Val	Gly	Ala	Met	Pro	Asp	Pro	Ala	Gly	Ala	Thr	Val	Gln	Ala
3230						3235					3240			
Arg	Leu	Cys	Ala	Leu	Cys	Gln	Val	Leu	Leu	Gly	Lys	Pro	Val	Thr
3245						3250					3255			
Ala	Gln	Met	Asp	Phe	Phe	Ala	Val	Gly	Gly	His	Ser	Val	Leu	Ala
3260						3265					3270			
Ile	Gln	Leu	Val	Ser	Arg	Ile	Arg	Lys	Ser	Phe	Gly	Val	Glu	Tyr
3275						3280					3285			
Pro	Val	Ser	Ala	Leu	Phe	Glu	Ser	Ala	Leu	Leu	Ser	Asp	Met	Ala

3290					3295					3300				
Arg	Gln	Ile	Glu	Gln	Leu	Arg	Val	Asn	Gly	Val	Ala	Lys	Arg	Met
3305						3310					3315			
Pro	Ala	Leu	Leu	Pro	Ala	Gly	Arg	Val	Gly	Ala	Ile	Pro	Ala	Thr
3320						3325					3330			
Tyr	Ala	Gln	Glu	Arg	Leu	Trp	Leu	Val	His	Glu	His	Met	Ser	Glu
3335						3340					3345			
Gln	Arg	Ser	Ser	Tyr	Asn	Ile	Thr	Phe	Ala	Met	His	Phe	Arg	Gly
3350						3355					3360			
Val	Asp	Phe	Arg	Ala	Glu	Ala	Met	Arg	Ala	Ala	Leu	Asn	Ala	Leu
3365						3370					3375			
Val	Val	Arg	His	Glu	Val	Leu	Arg	Thr	Arg	Phe	Leu	Ser	Glu	Asp
3380						3385					3390			
Gly	Gln	Leu	Gln	Gln	Val	Ile	Ala	Ala	Ser	Leu	Thr	Leu	Glu	Val
3395						3400					3405			
Pro	Val	Arg	Glu	Met	Ser	Val	Glu	Glu	Val	Asp	Leu	Leu	Leu	Ala
3410						3415					3420			
Ala	Ser	Thr	Arg	Glu	Thr	Phe	Asp	Leu	Arg	Gln	Gly	Pro	Leu	Phe
3425						3430					3435			
Lys	Ala	Arg	Ile	Leu	Arg	Val	Ala	Ala	Asp	His	His	Val	Val	Leu
3440						3445					3450			
Ser	Ser	Ile	His	His	Ile	Ile	Ser	Asp	Gly	Trp	Ser	Leu	Gly	Val
3455						3460					3465			
Phe	Asn	Arg	Asp	Leu	His	Gln	Leu	Tyr	Glu	Ala	Cys	Leu	Arg	Gly
3470						3475					3480			
Thr	Pro	Pro	Thr	Leu	Pro	Thr	Leu	Ala	Val	Gln	Tyr	Ala	Asp	Tyr
3485						3490					3495			
Ala	Leu	Trp	Gln	Arg	Gln	Trp	Glu	Leu	Ala	Ala	Pro	Leu	Ser	Tyr
3500						3505					3510			
Trp	Thr	Arg	Ala	Leu	Glu	Gly	Tyr	Asp	Asp	Gly	Leu	Asp	Leu	Pro
3515						3520					3525			
Tyr	Asp	Arg	Pro	Arg	Gly	Ala	Thr	Arg	Ala	Trp	Arg	Ala	Gly	Leu
3530						3535					3540			
Val	Lys	His	Arg	Tyr	Pro	Pro	Gln	Leu	Ala	Gln	Gln	Leu	Ala	Ala
3545						3550					3555			
Tyr	Ser	Gln	Gln	Tyr	Gln	Ala	Thr	Leu	Phe	Met	Ser	Leu	Leu	Ala
3560						3565					3570			
Gly	Leu	Ala	Leu	Val	Leu	Gly	Arg	Tyr	Ala	Asp	Arg	Lys	Asp	Val
3575						3580					3585			
Cys	Ile	Gly	Ala	Thr	Val	Ser	Gly	Arg	Asp	Gln	Leu	Glu	Leu	Glu
3590						3595					3600			

Glu	Leu	Ile	Gly	Phe	Phe	Ile	Asn	Ile	Leu	Pro	Leu	Arg	Val	Asp
3605						3610					3615			
Leu	Ser	Gly	Asp	Pro	Cys	Leu	Glu	Glu	Val	Leu	Leu	Arg	Thr	Arg
3620						3625					3630			
Gln	Val	Val	Leu	Asp	Gly	Phe	Ala	His	Gln	Ser	Val	Pro	Phe	Glu
3635						3640					3645			
His	Val	Leu	Gln	Ala	Leu	Arg	Arg	Gln	Arg	Asp	Ser	Ser	Gln	Ile
3650						3655					3660			
Pro	Leu	Val	Pro	Val	Met	Leu	Arg	His	Gln	Asn	Phe	Pro	Thr	Gln
3665						3670					3675			
Glu	Ile	Gly	Asp	Trp	Pro	Glu	Gly	Val	Arg	Leu	Thr	Gln	Met	Glu
3680						3685					3690			
Leu	Gly	Leu	Asp	Arg	Ser	Thr	Pro	Ser	Glu	Leu	Asp	Trp	Gln	Phe
3695						3700					3705			
Tyr	Gly	Asp	Gly	Ser	Ser	Leu	Glu	Leu	Thr	Leu	Glu	Tyr	Ala	Gln
3710						3715					3720			
Asp	Leu	Phe	Asp	Glu	Ala	Thr	Val	Arg	Arg	Met	Ile	Ala	His	His
3725						3730					3735			
Gln	Gln	Ala	Leu	Glu	Ala	Met	Val	Ser	Arg	Pro	Gln	Leu	Arg	Val
3740						3745					3750			
Gly	Lys	Trp	Asp	Met	Leu	Thr	Ala	Glu	Glu	Arg	Arg	Leu	Phe	Ala
3755						3760					3765			
Ala	Leu	Asn	Ala	Thr	Gly	Thr	Pro	Arg	Glu	Trp	Pro	Ser	Leu	Ala
3770						3775					3780			
Gln	Gln	Phe	Glu	Arg	Gln	Ala	Gln	Ala	Thr	Pro	Gln	Ala	Ile	Ala
3785						3790					3795			
Cys	Val	Ser	Asp	Gly	Gln	Ser	Trp	Ser	Tyr	Ala	Gln	Leu	Glu	Ala
3800						3805					3810			
Arg	Ala	Asn	Gln	Leu	Ala	Gln	Ala	Leu	Arg	Gly	Gln	Gly	Ala	Gly
3815						3820					3825			
Arg	Asp	Val	Arg	Val	Ala	Val	Gln	Ser	Ala	Arg	Thr	Pro	Glu	Leu
3830						3835					3840			
Leu	Met	Ala	Leu	Leu	Ala	Ile	Phe	Lys	Ala	Gly	Ala	Cys	Tyr	Val
3845						3850					3855			
Pro	Ile	Asp	Pro	Ala	Tyr	Pro	Ala	Ala	Tyr	Arg	Glu	Gln	Ile	Leu
3860						3865					3870			
Ala	Glu	Val	Gln	Val	Ser	Ile	Val	Leu	Glu	Gln	Asp	Glu	Leu	Ala
3875						3880					3885			
Leu	Asp	Glu	Gln	Gly	Gln	Phe	His	Asn	Pro	Arg	Trp	Arg	Glu	Gln
3890						3895					3900			

Ala	Pro	Thr	Pro	Leu	Gly	Leu	Arg	Glu	His	Pro	Gly	Asp	Leu	Ala
3905						3910					3915			
Cys	Val	Met	Val	Thr	Ser	Gly	Ser	Thr	Gly	Arg	Pro	Lys	Gly	Val
3920						3925					3930			
Met	Val	Pro	Tyr	Ala	Gln	Leu	Tyr	Asn	Trp	Leu	His	Ala	Gly	Trp
3935						3940					3945			
Gln	Arg	Ser	Pro	Phe	Glu	Ala	Gly	Glu	Arg	Val	Leu	Gln	Lys	Thr
3950						3955					3960			
Ser	Ile	Ala	Phe	Ala	Val	Ser	Val	Lys	Glu	Leu	Leu	Ser	Gly	Leu
3965						3970					3975			
Leu	Ala	Gly	Val	Glu	Gln	Val	Met	Leu	Pro	Asp	Glu	Gln	Val	Lys
3980						3985					3990			
Asp	Ser	Leu	Ala	Leu	Ala	Arg	Ala	Ile	Glu	Gln	Trp	Gln	Val	Thr
3995						4000					4005			
Arg	Leu	Tyr	Leu	Val	Pro	Ser	His	Leu	Gln	Ala	Leu	Leu	Asp	Ala
4010						4015					4020			
Thr	Gln	Gly	Arg	Asp	Gly	Leu	Leu	His	Ser	Leu	Arg	His	Val	Val
4025						4030					4035			
Thr	Ala	Gly	Glu	Ala	Leu	Pro	Ser	Ala	Val	Arg	Glu	Thr	Val	Arg
4040						4045					4050			
Ala	Arg	Leu	Pro	Gln	Val	Gln	Leu	Trp	Asn	Asn	Tyr	Gly	Cys	Thr
4055						4060					4065			
Glu	Leu	Asn	Asp	Ala	Thr	Tyr	His	Arg	Ser	Asp	Thr	Val	Ala	Pro
4070						4075					4080			
Gly	Thr	Phe	Val	Pro	Ile	Gly	Ala	Pro	Ile	Ala	Asn	Thr	Glu	Val
4085						4090					4095			
Tyr	Val	Leu	Asp	Arg	Gln	Leu	Arg	Gln	Val	Pro	Ile	Gly	Val	Met
4100						4105					4110			
Gly	Glu	Leu	His	Val	His	Ser	Val	Gly	Met	Ala	Arg	Gly	Tyr	Trp
4115						4120					4125			
Asn	Arg	Pro	Gly	Leu	Thr	Ala	Ser	Arg	Phe	Ile	Ala	His	Pro	Tyr
4130						4135					4140			
Ser	Glu	Glu	Pro	Gly	Thr	Arg	Leu	Tyr	Lys	Thr	Gly	Asp	Met	Val
4145						4150					4155			
Arg	Arg	Leu	Ala	Asp	Gly	Thr	Leu	Glu	Tyr	Leu	Gly	Arg	Gln	Asp
4160						4165					4170			
Phe	Glu	Val	Lys	Val	Arg	Gly	His	Arg	Val	Asp	Thr	Arg	Gln	Val
4175						4180					4185			
Glu	Ala	Ala	Leu	Arg	Ala	Gln	Pro	Ala	Val	Ala	Glu	Ala	Val	Val
4190						4195					4200			
Ser	Gly	His	Arg	Val	Asp	Gly	Asp	Met	Gln	Leu	Val	Ala	Tyr	Val

4205					4210					4215				
Val	Ala	Arg	Glu	Gly	Gln	Ala	Pro	Ser	Ala	Gly	Glu	Leu	Lys	Gln
4220						4225					4230			
Gln	Leu	Ser	Ala	Gln	Leu	Pro	Thr	Tyr	Met	Leu	Pro	Thr	Val	Tyr
4235						4240					4245			
Gln	Trp	Leu	Glu	Gln	Leu	Pro	Arg	Leu	Ser	Asn	Gly	Lys	Leu	Asp
4250						4255					4260			
Arg	Leu	Ala	Leu	Pro	Ala	Pro	Gln	Ala	Val	His	Ala	Gln	Glu	Tyr
4265						4270					4275			
Val	Ala	Pro	Arg	Asn	Gln	Ala	Glu	Gln	Arg	Leu	Ala	Ala	Leu	Phe
4280						4285					4290			
Ala	Glu	Val	Leu	Arg	Val	Glu	Gln	Val	Gly	Ile	His	Asp	Asn	Phe
4295						4300					4305			
Phe	Ala	Leu	Gly	Gly	His	Ser	Leu	Ser	Ala	Ser	Gln	Leu	Ile	Ser
4310						4315					4320			
Arg	Ile	Ala	Arg	Asp	Met	Ala	Ile	Asp	Leu	Pro	Leu	Ala	Met	Leu
4325						4330					4335			
Phe	Glu	Leu	Pro	Thr	Val	Ala	Gln	Leu	Ser	Glu	Ser	Leu	Ala	Ser
4340						4345					4350			
His	Ala	Arg	Asp	Ser	Asp	Tyr	Asp	Val	Ile	Pro	Ala	Ser	Thr	Glu
4355						4360					4365			
Glu	Ala	Thr	Ile	Pro	Leu	Ser	Thr	Ala	Gln	Glu	Arg	Met	Trp	Phe
4370						4375					4380			
Leu	His	Lys	Phe	Val	Gln	Glu	Thr	Pro	Tyr	Asn	Thr	Pro	Gly	Leu
4385						4390					4395			
Ala	Leu	Leu	Gln	Gly	Glu	Leu	Asp	Ile	Ser	Ala	Leu	Gln	Val	Ala
4400						4405					4410			
Phe	Arg	Cys	Val	Leu	Glu	Arg	His	Ala	Val	Leu	Arg	Thr	His	Phe
4415						4420					4425			
Val	Glu	Thr	Glu	Gln	Gln	Cys	Val	Gln	Val	Ile	Gly	Ala	Ala	Glu
4430						4435					4440			
Gln	Phe	Val	Leu	Gln	Leu	Arg	Ser	Ile	Arg	Asp	Glu	Ala	Asp	Leu
4445						4450					4455			
His	Gly	Leu	Leu	His	Thr	Ala	Val	Ser	Glu	Pro	Phe	Asp	Leu	Glu
4460						4465					4470			
Arg	Glu	Leu	Pro	Leu	Arg	Ala	Leu	Leu	Tyr	Arg	Leu	Asp	Asp	Arg
4475						4480					4485			
Arg	His	Tyr	Leu	Ala	Val	Val	Ile	His	His	Ile	Val	Phe	Asp	Gly
4490						4495					4500			
Trp	Ser	Thr	Ser	Ile	Leu	Phe	Arg	Glu	Leu	Ala	Thr	His	Tyr	Ala
4505						4510					4515			

Ala Cys	Arg His Gly Gln Ser	Ala Pro Leu Pro Pro	Leu Glu Leu
4520	4525	4530	
Ser Tyr	Ala Asp Tyr Ala Arg	Trp Glu Arg Ala Arg	Leu Asn Gln
4535	4540	4545	
Glu Asp	Ala Leu Arg Lys Leu	Glu Tyr Trp Lys Thr	Gln Leu Ala
4550	4555	4560	
Asp Ala	Pro Pro Leu Val Leu	Pro Thr Thr Tyr Ala	Arg Pro Val
4565	4570	4575	
Phe Gln	Asn Phe Asn Gly Ala	Thr Val Ala Leu Gln	Ile Glu Pro
4580	4585	4590	
Pro Leu	Leu Gln Arg Leu Gln	Arg Phe Ala Asp Ala	His Ser Phe
4595	4600	4605	
Thr Leu	Tyr Met Leu Leu Leu	Ala Ala Leu Gly Val	Val Leu Ser
4610	4615	4620	
Arg His	Ala Arg Gln Lys His	Phe Cys Ile Gly Ser	Pro Val Ala
4625	4630	4635	
Asn Arg	Ala Arg Ala Glu Leu	His Gly Leu Ile Gly	Leu Phe Val
4640	4645	4650	
Asn Thr	Leu Ala Val Arg Leu	Asp Leu Asp Gly Asn	Pro Ser Val
4655	4660	4665	
Arg Glu	Leu Leu Glu Arg Ile	His Cys Thr Thr Leu	Ala Ala Tyr
4670	4675	4680	
Glu His	Gln Asp Val Pro Phe	Glu Arg Ile Val Glu	Ser Leu Lys
4685	4690	4695	
Val Pro	Arg Asp Thr Ala Arg	Asn Pro Leu Gly Gln	Val Met Leu
4700	4705	4710	
Asn Phe	Gln Asn Met Pro Met	Ser Ala Phe Asp Leu	Asp Gly Val
4715	4720	4725	
Gln Val	Gln Val Leu Pro Met	His Asn Gly Thr Ala	Lys Cys Glu
4730	4735	4740	
Leu Thr	Phe Asp Leu Leu Leu	Asp Gly Ser Arg Leu	Ser Gly Phe
4745	4750	4755	
Val Glu	Tyr Ala Thr Gly Leu	Phe Ala Pro Glu Trp	Val Gln Ala
4760	4765	4770	
Leu Val	Gln Gln Phe Lys Cys	Val Leu Ala Ala Leu	Val Glu Arg
4775	4780	4785	
Pro Glu	Ala Ser Leu Asn Asp	Leu Pro Met Ala Pro	Asn Glu Ala
4790	4795	4800	
Gln Pro	Ala Ser Pro Ala Leu	Met Lys His Val Ala	Pro Ser Leu
4805	4810	4815	
Pro Asn	Leu Leu Glu Ala Met	Ala Ala Asn Asp Ala	Ala Arg Leu



4820					4825					4830				
Ala	Leu	Gln	Ala	Pro	Glu	Gly	Ala	Leu	Ser	Tyr	Ala	Gln	Leu	Ile
4835						4840					4845			
Glu	Ala	Ala	Asn	Glu	Phe	Ala	Trp	Arg	Leu	Arg	Cys	Glu	His	Ala
4850					4855					4860				
Gly	Pro	Asp	Lys	Val	Val	Ala	Leu	Cys	Leu	Ala	Pro	Cys	Ser	Ala
4865					4870					4875				
Leu	Val	Val	Ala	Leu	Leu	Ala	Ala	Ser	Leu	Cys	Gly	Ala	Ala	Ser
4880					4885					4890				
Val	Leu	Ile	Asp	Pro	Thr	Thr	Thr	Ala	Glu	Ala	Gln	Tyr	Asp	Gln
4895					4900					4905				
Leu	Phe	Glu	Thr	Arg	Ala	Gly	Ile	Val	Val	Thr	Cys	Ser	Ser	Leu
4910					4915					4920				
Leu	Glu	Lys	Leu	Pro	Leu	Asp	Asp	Gln	Ala	Val	Val	Leu	Ile	Asp
4925					4930					4935				
Glu	Gln	Ala	Ala	Glu	Ala	Thr	Pro	Arg	Leu	Met	His	Phe	Thr	Asp
4940					4945					4950				
Asp	Pro	Ala	Leu	Pro	Ala	Met	Leu	Tyr	Cys	Val	Cys	Asp	Glu	Lys
4955					4960					4965				
Gly	Arg	Thr	Arg	Thr	Ile	Met	Val	Glu	Ser	Gly	Ser	Leu	Ser	Ser
4970					4975					4980				
Arg	Leu	Leu	Asp	Ser	Val	Gln	Arg	Phe	Ser	Leu	Glu	Arg	Thr	Asp
4985					4990					4995				
Arg	Phe	Leu	Leu	Arg	Ser	Pro	Leu	Ser	Ala	Glu	Leu	Ala	Asn	Thr
5000					5005					5010				
Glu	Val	Leu	Gln	Trp	Leu	Ala	Ala	Gly	Gly	Ser	Leu	Ser	Ile	Ala
5015					5020					5025				
Pro	Met	His	Gly	Asp	Phe	Asp	Ala	Ala	Ala	Trp	Leu	Glu	Thr	Leu
5030					5035					5040				
Ala	Thr	Tyr	Ala	Ile	Thr	Val	Ala	Tyr	Leu	Ala	Gln	Val	Glu	Leu
5045					5050					5055				
Thr	Glu	Met	Leu	Ala	His	Leu	Gln	Asn	His	Pro	Leu	Glu	Arg	Asn
5060					5065					5070				
Lys	Leu	Ala	Gly	Leu	Arg	Val	Leu	Val	Val	His	Gly	Ala	Pro	Leu
5075					5080					5085				
Pro	Ile	Ala	Pro	Leu	Met	Arg	Leu	Asp	Ala	Trp	Leu	Arg	Glu	Val
5090					5095					5100				
Gly	Gly	Ser	Ala	Arg	Ile	Phe	Ala	Ala	Tyr	Gly	Asn	Ala	Glu	Phe
5105					5110					5115				
Gly	Ala	Glu	Ile	Leu	Ser	Gln	Asp	Val	Ser	Ala	Ala	Leu	Gln	Ala
5120					5125					5130				

Gly Ile 5135	Gly Ala Gln Tyr 5140	Lys His Arg Arg Gly Leu Phe Pro Leu 5145
Gly Ala 5150	Asn Ser Met Cys His 5155	Val Val Gln Ser Asn Gly Arg Ile 5160
Ala Pro 5165	Asp Gly Met Val Gly 5170	Glu Leu Trp Ile Thr Gln Pro Ala 5175
Cys Leu 5180	Tyr Lys Thr Asp Ala 5185	Leu Val Arg Arg Leu Ala Asn Gly 5190
Gln Leu 5195	Glu Trp Leu Gly Ser 5200	Leu Asp Val Gln Ser Arg Ile Asp 5205
Asp Pro 5210	Arg Ile Asp Leu Cys 5215	Val Val Glu Ala Gln Leu Arg Leu 5220
Cys Glu 5225	Asp Val Gly Glu Ala 5230	Val Val Leu Tyr Glu Pro Leu Lys 5235
Arg Cys 5240	Leu Val Ala Tyr Leu 5245	Ser Ala Arg Ser Thr Ala Ala Ile 5250
Met Thr 5255	Asp Glu Thr Leu Ala 5260	Arg Ile Arg Gln Ala Leu Ser Glu 5265
Thr Leu 5270	Pro Asp Tyr Leu Leu 5275	Pro Ala Ile Trp Val Pro Leu Ala 5280
His Trp 5285	Pro Arg Leu Pro His 5290	Gly Arg Val Asp Leu Gly Ala Leu 5295
Pro Ala 5300	Pro Asp Phe Asp Leu 5305	Ala Arg His Glu Ser Tyr Ile Ala 5310
Pro Arg 5315	Thr Ala Val Glu Gln 5320	Ala Val Ala Glu Ile Trp Gln Arg 5325
Val Leu 5330	Lys Arg Thr Gln Val 5335	Gly Val His Asp Asn Phe Phe Glu 5340
Leu Gly 5345	Gly His Ser Val Leu 5350	Ala Ile Gln Leu Val Ser Gly Leu 5355
Arg Lys 5360	Ala Leu Ala Ile Glu 5365	Val Pro Val Thr Leu Val Phe Glu 5370
Ala Pro 5375	Ile Leu Gly Ala Leu 5380	Ala Arg Gln Ile Ala Pro Leu Leu 5385
Val Ser 5390	Glu Arg Arg Pro Arg 5395	Pro Pro Gly Leu Thr Arg Leu Glu 5400
His Thr 5405	Gly Pro Ile Pro Ala 5410	Ser Tyr Ala Gln Glu Arg Leu Trp 5415
Leu Val 5420	His Glu His Met Glu 5425	Glu Gln Arg Thr Ser Tyr Asn Ile 5430

Ser	Asn	Ala	Ala	His	Phe	Ile	Gly	Ala	Ala	Phe	Ser	Val	Glu	Ala
5435						5440					5445			
Met	Arg	Ala	Ala	Leu	Asn	Ala	Leu	Val	Ala	Arg	His	Glu	Val	Leu
5450						5455					5460			
Arg	Thr	Arg	Phe	Leu	Ser	Glu	Asp	Gly	Gln	Leu	Gln	Gln	Val	Ile
5465						5470					5475			
Ala	Ala	Ser	Leu	Thr	Leu	Glu	Val	Pro	Val	Arg	Glu	Val	Ser	Ala
5480						5485					5490			
Glu	Glu	Val	Asp	Leu	Leu	Leu	Ala	Ala	Ser	Thr	Arg	Glu	Thr	Phe
5495						5500					5505			
Asp	Leu	Arg	Gln	Gly	Pro	Leu	Phe	Lys	Ala	Arg	Ile	Leu	Arg	Val
5510						5515					5520			
Ala	Ala	Asp	His	His	Val	Val	Leu	Ser	Ser	Ile	His	His	Ile	Ile
5525						5530					5535			
Ser	Asp	Gly	Trp	Ser	Leu	Gly	Val	Phe	Asn	Arg	Asp	Leu	His	Gln
5540						5545					5550			
Leu	Tyr	Glu	Ala	Cys	Leu	Arg	Gly	Thr	Pro	Pro	Thr	Leu	Pro	Thr
5555						5560					5565			
Leu	Ala	Val	Gln	Tyr	Ala	Asp	Tyr	Ala	Leu	Trp	Gln	Arg	Gln	Trp
5570						5575					5580			
Glu	Leu	Ala	Ala	Pro	Leu	Ser	Tyr	Trp	Thr	Arg	Ala	Leu	Glu	Gly
5585						5590					5595			
Tyr	Asp	Asp	Gly	Leu	Asp	Leu	Pro	Tyr	Asp	Arg	Pro	Arg	Gly	Ala
5600						5605					5610			
Thr	Arg	Ala	Trp	Arg	Ala	Gly	Leu	Val	Lys	His	Arg	Tyr	Pro	Pro
5615						5620					5625			
Gln	Leu	Ala	Gln	Gln	Leu	Ala	Ala	Tyr	Ser	Gln	Gln	Tyr	Gln	Ala
5630						5635					5640			
Thr	Leu	Phe	Met	Ser	Leu	Leu	Ala	Gly	Leu	Ala	Leu	Val	Leu	Gly
5645						5650					5655			
Arg	Tyr	Ala	Asp	Arg	Lys	Asp	Val	Cys	Ile	Gly	Ala	Thr	Val	Ser
5660						5665					5670			
Gly	Arg	Asp	Gln	Leu	Glu	Leu	Glu	Glu	Leu	Ile	Gly	Phe	Phe	Ile
5675						5680					5685			
Asn	Ile	Leu	Pro	Leu	Arg	Val	Asp	Leu	Ser	Gly	Asp	Pro	Cys	Leu
5690						5695					5700			
Glu	Glu	Val	Leu	Leu	Arg	Thr	Arg	Gln	Val	Val	Leu	Asp	Gly	Phe
5705						5710					5715			
Ala	His	Gln	Ser	Val	Pro	Phe	Glu	His	Val	Leu	Gln	Ala	Leu	Arg
5720						5725					5730			
Arg	Gln	Arg	Asp	Ser	Ser	Gln	Ile	Pro	Leu	Val	Pro	Val	Met	Leu

5735	5740	5745
Arg His Gln Asn Phe Pro Thr 5750	Gln Glu Ile Gly Asp 5755	Trp Pro Glu 5760
Gly Val Arg Leu Thr Gln Met 5765	Glu Leu Gly Leu Asp 5770	Arg Ser Thr 5775
Pro Ser Glu Leu Asp Trp Gln 5780	Phe Tyr Gly Asp Gly 5785	Ser Ser Leu 5790
Glu Leu Thr Leu Glu Tyr Ala 5795	Gln Asp Leu Phe Asp 5800	Glu Ala Thr 5805
Val Arg Arg Met Ile Ala His 5810	His Gln Gln Ala Leu 5815	Glu Ala Met 5820
Val Ser Arg Pro Gln Leu Arg 5825	Val Gly Lys Trp Asp 5830	Met Leu Thr 5835
Ala Glu Glu Arg Arg Leu Phe 5840	Ala Ala Leu Asn Ala 5845	Thr Gly Thr 5850
Pro Arg Glu Trp Pro Ser Leu 5855	Ala Gln Gln Phe Glu 5860	Arg Gln Ala 5865
Gln Ala Thr Pro Gln Ala Ile 5870	Ala Cys Val Ser Asp 5875	Gly Gln Ser 5880
Trp Ser Tyr Ala Gln Leu Glu 5885	Ala Arg Ala Asn Gln 5890	Leu Ala Gln 5895
Ala Leu Arg Gly Gln Gly Ala 5900	Gly Arg Asp Val Arg 5905	Val Ala Val 5910
Gln Ser Ala Arg Thr Pro Glu 5915	Leu Leu Met Ala Leu 5920	Leu Ala Ile 5925
Phe Lys Ala Gly Ala Cys Tyr 5930	Val Pro Ile Asp Pro 5935	Ala Tyr Pro 5940
Ala Ala Tyr Arg Glu Gln Ile 5945	Leu Ala Glu Val Gln 5950	Val Ser Ile 5955
Val Leu Glu Gln Gly Glu Leu 5960	Ala Leu Asp Glu Gln 5965	Gly Gln Phe 5970
Arg Asn Arg Arg Trp Arg Glu 5975	Gln Ala Pro Thr Pro 5980	Leu Gly Leu 5985
Arg Gly His Pro Gly Asp Leu 5990	Ala Cys Val Met Val 5995	Thr Ser Gly 6000
Ser Thr Gly Arg Pro Lys Gly 6005	Val Met Val Pro Tyr 6010	Ala Gln Leu 6015
His Asn Trp Leu His Ala Gly 6020	Trp Gln Arg Ser Ala 6025	Phe Glu Ala 6030
Gly Glu Arg Val Leu Gln Lys 6035	Thr Ser Ile Ala Phe 6040	Ala Val Ser 6045

Val Lys 6050	Glu Leu Leu Ser 6055	Gly Leu Leu Ala Gly 6060	Val Gly Gln Val
Met Leu 6065	Pro Asp Glu Gln 6070	Lys Asp Ser Leu Ala 6075	Leu Ala Arg
Ala Ile 6080	Glu Gln Trp Gln 6085	Thr Arg Leu Tyr Leu 6090	Val Pro Ser
His Leu 6095	Gln Ala Leu Leu Asp 6100	Ala Thr Gln Gly Arg 6105	Asp Gly Leu
Leu His 6110	Ser Leu Arg His 6115	Val Thr Ala Gly Glu 6120	Ala Leu Pro
Ser Ala 6125	Val Gly Glu Ala Val 6130	Arg Val Arg Leu Pro 6135	Gln Val Gln
Leu Trp 6140	Asn Asn Tyr Gly Cys 6145	Thr Glu Leu Asn Asp 6150	Ala Thr Tyr
His Arg 6155	Ser Asp Thr Val Ala 6160	Pro Gly Thr Phe Val 6165	Pro Ile Gly
Ala Pro 6170	Ile Ala Asn Thr Glu 6175	Val Tyr Val Leu Asp 6180	Arg Gln Leu
Arg Gln 6185	Val Pro Ile Gly Val 6190	Met Gly Glu Leu His 6195	Val His Ser
Val Gly 6200	Met Ala Arg Gly Tyr 6205	Trp Asn Arg Pro Gly 6210	Leu Thr Ala
Ser Arg 6215	Phe Ile Ala His Pro 6220	Tyr Ser Glu Glu Pro 6225	Gly Thr Arg
Leu Tyr 6230	Lys Thr Gly Asp Met 6235	Val Arg Arg Leu Ala 6240	Asp Gly Thr
Leu Glu 6245	Tyr Leu Gly Arg Gln 6250	Asp Phe Glu Val Lys 6255	Val Arg Gly
His Arg 6260	Val Asp Thr Arg Gln 6265	Val Glu Ala Ala Leu 6270	Arg Ala Gln
Pro Ala 6275	Val Ala Glu Ala Val 6280	Val Ser Gly His Arg 6285	Val Asp Gly
Asp Met 6290	Gln Leu Val Ala Tyr 6295	Val Val Ala Arg Glu 6300	Gly Gln Ala
Pro Ser 6305	Ala Gly Glu Leu Lys 6310	Gln Gln Leu Ser Ala 6315	Gln Leu Pro
Thr Tyr 6320	Met Leu Pro Thr Val 6325	Tyr Gln Trp Leu Glu 6330	Gln Leu Pro
Arg Leu 6335	Ser Asn Gly Lys Leu 6340	Asp Arg Leu Ala Leu 6345	Pro Ala Pro
Gln Val	Val His Ala Gln Glu	Tyr Val Ala Pro Arg	Asn Glu Ala

6350	6355	6360
Glu Gln Arg Leu Ala Ala	Leu Phe Ala Glu Val	Leu Arg Val Glu
6365	6370	6375
Gln Val Gly Ile His Asp	Asn Phe Phe Ala Leu	Gly Gly His Ser
6380	6385	6390
Leu Ser Ala Ser Gln Leu	Ile Ser Arg Ile Arg	Gln Ser Phe His
6395	6400	6405
Val Asp Leu Pro Leu Ser	Arg Ile Phe Glu Ala	Pro Thr Ile Glu
6410	6415	6420
Gly Leu Val Arg Gln Leu	Ala Leu Pro Ser Glu	Gly Gly Val Ala
6425	6430	6435
Ser Ile Ala Arg Val Ala	Arg Asn Arg Thr Ile	Pro Leu Ser Leu
6440	6445	6450
Phe Gln Glu Arg Leu Trp	Phe Val His Gln His	Met Pro Glu Gln
6455	6460	6465
Arg Thr Ser Tyr Asn Gly	Thr Leu Ala Leu Arg	Leu Arg Gly Pro
6470	6475	6480
Leu Ser Val Glu Ala Met	Arg Ala Ala Leu Arg	Ala Leu Val Leu
6485	6490	6495
Arg His Glu Ile Leu Arg	Thr Arg Phe Val Leu	Pro Thr Gly Ala
6500	6505	6510
Ser Glu Pro Val Gln Val	Ile Asp Glu His Ser	Asp Phe Gln Leu
6515	6520	6525
Ser Val Gln Leu Val Glu	Asp Thr Glu Ile Ala	Ser Leu Met Asp
6530	6535	6540
Glu Leu Ala Ser His Ile	Tyr Asp Leu Ala Asn	Gly Pro Leu Phe
6545	6550	6555
Ile Ala Cys Leu Leu Gln	Leu Asp Glu Gln Glu	His Val Leu Leu
6560	6565	6570
Ile Gly Met His His Leu	Ile Tyr Asp Ala Trp	Ser Gln Phe Thr
6575	6580	6585
Val Met Asn Arg Asp Leu	Arg Val Leu Tyr His	Arg His Leu Gly
6590	6595	6600
Leu Ala Gly Gly Asp Leu	Pro Glu Leu Pro Ile	Gln Tyr Ala Asp
6605	6610	6615
Tyr Ala Ile Trp Gln Arg	Ala Gln Asn Leu Asp	Ala Gln Leu Ala
6620	6625	6630
Tyr Trp Gln Ala Met Leu	His Asp Tyr Asp Asp	Gly Leu Glu Leu
6635	6640	6645
Pro Tyr Asp Tyr Pro Arg	Pro Arg Asn Arg Thr	Trp His Ala Ala
6650	6655	6660

Val Tyr Thr His Thr Tyr Pro Ala Glu Leu Val Gln Arg Phe Ala  
 6665 6670 6675  
 Gly Phe Val Gln Ala His Gln Ser Thr Leu Phe Ile Gly Leu Leu  
 6680 6685 6690  
 Ala Ser Phe Ala Val Val Leu Asn Lys Tyr Thr Gly Arg Asp Asp  
 6695 6700 6705  
 Leu Cys Ile Gly Thr Thr Thr Ala Gly Arg Thr His Leu Glu Leu  
 6710 6715 6720  
 Glu Asn Leu Ile Gly Phe Phe Ile Asn Ile Leu Pro Leu Arg Leu  
 6725 6730 6735  
 Arg Leu Asp Gly Asp Pro Asp Val Ala Glu Ile Met Arg Arg Thr  
 6740 6745 6750  
 Arg Leu Val Ala Met Ser Ala Phe Glu Asn Gln Ala Leu Pro Phe  
 6755 6760 6765  
 Glu His Leu Leu Asn Ala Leu His Lys Gln Arg Asp Thr Ser Arg  
 6770 6775 6780  
 Ile Pro Leu Val Pro Val Val Met Arg His Gln Asn Phe Pro Asp  
 6785 6790 6795  
 Thr Ile Gly Asp Trp Ser Asp Gly Ile Arg Thr Glu Val Ile Gln  
 6800 6805 6810  
 Arg Asp Leu Arg Ala Thr Pro Asn Glu Met Asp Leu Gln Phe Phe  
 6815 6820 6825  
 Gly Asp Gly Thr Gly Leu Ser Val Thr Val Glu Tyr Ala Ala Glu  
 6830 6835 6840  
 Leu Phe Ser Glu Ala Thr Ile Arg Arg Leu Ile His His His Gln  
 6845 6850 6855  
 Leu Val Leu Glu Gln Met Leu Ala Ala His Glu Ser Ala Thr Cys  
 6860 6865 6870  
 Pro Leu Asp Val Ala Asp  
 6875

<210> 27  
 <211> 343  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 27

Met Asp Ser Ala Leu Pro Thr Ser Ala Phe Thr Phe Asp Leu Phe Tyr  
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 Thr Thr Val Asn Ala Tyr Tyr Arg Thr Ala Ala Val Lys Ala Ala Ile  
 20 25 30  
 Glu Leu Gly Leu Phe Asp Val Val Gly Gln Gln Gly Arg Thr Pro Ala  
 35 40 45



Ala Ile Ala Glu Ala Cys Gln Ala Ser Pro Arg Gly Ile Arg Ile Leu  
 50 55 60  
 Cys Tyr Tyr Leu Val Ser Ile Gly Phe Leu Arg Arg Asn Gly Gly Leu  
 65 70 75 80  
 Phe Tyr Ile Asp Arg Asn Met Ala Met Tyr Leu Asp Arg Ser Ser Pro  
 85 90 95  
 Gly Tyr Leu Gly Gly Ser Ile Lys Phe Leu Leu Ser Pro Tyr Ile Met  
 100 105 110  
 Ser Ala Phe Thr Asp Leu Thr Ala Val Val Arg Thr Gly Lys Ile Asn  
 115 120 125  
 Leu Ala Gln Asp Gly Val Val Ala Pro Asp His Pro Gln Trp Val Glu  
 130 135 140  
 Phe Ala Arg Ala Met Ala Pro Met Met Ala Leu Pro Ser Ala Leu Ile  
 145 150 155 160  
 Ala Asn Met Val Ser Leu Pro Ala Asp Arg Pro Ile Arg Val Leu Asp  
 165 170 175  
 Val Ala Ala Gly His Gly Leu Phe Gly Ile Ala Phe Ala Gln Arg Phe  
 180 185 190  
 Arg Gln Ala Glu Val Ser Phe Leu Asp Trp Asp Asn Val Leu Asp Val  
 195 200 205  
 Ala Arg Glu Asn Ala Gln Ala Ala Lys Val Ala Glu Arg Ala Arg Phe  
 210 215 220  
 Leu Pro Gly Asn Ala Phe Asp Leu Asp Tyr Gly Ser Gly Tyr Asp Val  
 225 230 235 240  
 Ile Leu Leu Thr Asn Phe Leu His His Phe Asp Glu Val Asp Gly Glu  
 245 250 255  
 Arg Ile Leu Ala Lys Thr Arg Asp Ala Leu Asn Asp Asp Gly Met Val  
 260 265 270  
 Ile Thr Phe Glu Phe Ile Ala Asp Glu Glu Arg Ser Ser Pro Pro Leu  
 275 280 285  
 Ala Ala Thr Phe Ser Met Met Met Leu Gly Thr Thr Pro Ala Gly Glu  
 290 295 300  
 Ser Tyr Thr Tyr Ser Asp Leu Glu Arg Met Phe Arg His Ala Gly Phe  
 305 310 315 320  
 Gly His Val Glu Leu Lys Ser Ile Pro Pro Ala Leu Leu Lys Val Val  
 325 330 335  
 Val Ser Arg Lys Arg Ala Pro  
 340

<210> 28  
 <211> 167

&lt;212&gt; PRT

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 28

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Met Ile Glu Ser Ala Thr Ser Pro Val Ala Lys Thr Glu Arg Ile Trp
1           5           10           15

Cys Thr Glu Leu Asp Leu Asp Ala Leu Asn Ala Met Ser Ala Asn Thr
          20           25           30

Met Gln Ala Leu Leu Gly Ile Arg Met Ile Glu Ile Gly Ser Asp Tyr
          35           40           45

Leu Val Ser Cys Met Ser Val Asp Trp Arg Cys His Gln Pro Tyr Gly
          50           55           60

Val Leu His Gly Gly Ala Ser Val Thr Leu Ala Glu Ala Thr Gly Ser
65           70           75           80

Met Ala Ala Ser Met Cys Val Pro Ala Gly Gln Arg Cys Val Gly Leu
          85           90           95

Asp Ile Asn Ala Asn His Ile Ala Ser Ile Ser Ser Gly Gln Val Gln
          100          105          110

Cys Ile Ala Arg Pro Leu His Ile Gly Ala Leu Thr Gln Val Trp Gln
          115          120          125

Met Arg Ile Tyr Asp Glu Gly Asp Arg Thr Ile Cys Val Ser Arg Leu
          130          135          140

Thr Met Ala Val Leu Ser Val His Val Ala Arg Val Ser Pro Asn Pro
145          150          155          160

Ala Ser Ser Gly Val Gln Thr
          165

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&lt;210&gt; 29

&lt;211&gt; 941

&lt;212&gt; PRT

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 29

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Met Asn Glu Thr Ala Thr Val Thr Lys Ala Thr Leu Ser Ser Ala Lys
1           5           10           15

Ala Ser Ile Thr Pro Ala Cys Val His Gln Trp Phe Glu Ala Gln Val
          20           25           30

Ser Ser Thr Pro Asp Ala Pro Ala Ala Phe Leu Gly Glu Arg Arg Met
          35           40           45

Ser Tyr Gly Gln Leu Asn Thr Arg Ala Asn Arg Leu Ala Arg Leu Leu
          50           55           60

Gln Ser Gln Gly Val Gly Pro Gly Ala Arg Val Ala Val Trp Met Asn
65           70           75           80

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Arg Ser Pro Glu Cys Leu Ala Ala Leu Leu Ala Val Met Lys Ala Gly  
 85 90 95  
 Ala Ala Tyr Val Pro Ile Asp Leu Ser Leu Pro Ile Arg Arg Val Gln  
 100 105 110  
 Tyr Ile Leu Gln Asp Ser Gln Ala Arg Leu Val Leu Val Asp Asp Glu  
 115 120 125  
 Gly Gln Gly Arg Leu Asp Glu Leu Glu Leu Gly Ala Met Thr Ala Val  
 130 135 140  
 Asp Val Cys Gly Thr Leu Asp Gly Asp Glu Ala Asn Leu Asp Leu Pro  
 145 150 155 160  
 Cys Asp Pro Ala Gln Pro Val Tyr Cys Ile Tyr Thr Ser Gly Ser Thr  
 165 170 175  
 Gly Ser Pro Lys Gly Val Leu Val Arg His Ser Gly Leu Ala Asn Tyr  
 180 185 190  
 Val Ala Trp Ala Lys Arg Gln Tyr Val Thr Ala Asp Thr Thr Ser Phe  
 195 200 205  
 Ala Phe Tyr Ser Ser Leu Ser Phe Asp Leu Thr Val Thr Ser Ile Tyr  
 210 215 220  
 Val Pro Leu Val Ala Gly Leu Cys Val His Val Tyr Pro Glu Gln Gly  
 225 230 235 240  
 Asp Asp Val Pro Val Ile Asn Arg Val Leu Asp Asp Asn Gln Val Asp  
 245 250 255  
 Val Ile Lys Leu Thr Pro Ser His Met Leu Met Leu Arg Asn Ala Ala  
 260 265 270  
 Leu Ala Thr Ser Arg Leu Lys Thr Leu Ile Val Gly Gly Glu Asp Leu  
 275 280 285  
 Lys Ala Ala Val Ala Tyr Asp Ile His Gln Arg Phe Arg Arg Asp Val  
 290 295 300  
 Ala Ile Tyr Asn Glu Tyr Gly Pro Thr Glu Thr Val Val Gly Cys Ala  
 305 310 315 320  
 Ile His Arg Tyr Asp Pro Ala Thr Glu Arg Glu Gly Ser Val Pro Ile  
 325 330 335  
 Gly Val Pro Ile Asp His Thr Ser Leu His Leu Leu Asp Glu Arg Leu  
 340 345 350  
 Gln Pro Val Ala Pro Gly Glu Val Gly Gln Ile His Ile Gly Gly Ala  
 355 360 365  
 Gly Val Ala Ile Gly Tyr Val Asn Lys Pro Glu Ile Thr Asp Ala Gln  
 370 375 380  
 Phe Ile Asp Asn Pro Phe Glu Gly Ser Gly Arg Leu Tyr Ala Ser Gly  
 385 390 395 400  
 Asp Leu Gly Arg Met Arg Ala Asp Gly Lys Leu Glu Phe Leu Gly Arg

405										410					415				
Lys	Asp	Ser	Gln	Ile	Lys	Leu	Arg	Gly	Tyr	Arg	Ile	Glu	Leu	Gly	Glu				
			420					425					430						
Ile	Glu	Asn	Val	Leu	Leu	Gly	His	Ala	Ala	Leu	Arg	Glu	Cys	Ile	Val				
		435					440					445							
Asp	Thr	Thr	Val	Ala	Pro	Arg	Arg	Asp	Tyr	Asp	Ser	Lys	Ser	Leu	Arg				
	450					455					460								
Tyr	Cys	Ala	Arg	Cys	Gly	Ile	Ala	Ser	Asn	Phe	Pro	Asn	Thr	Ser	Phe				
465					470					475					480				
Asp	Glu	His	Gly	Val	Cys	Asn	His	Cys	His	Ala	Tyr	Asp	Lys	Tyr	Arg				
			485						490					495					
Asn	Val	Val	Glu	Asp	Tyr	Phe	Arg	Thr	Glu	Asp	Glu	Leu	Arg	Thr	Ile				
			500					505					510						
Phe	Glu	Gln	Val	Lys	Ala	His	Asn	Arg	Leu	Arg	Tyr	Asp	Cys	Leu	Val				
		515					520					525							
Ala	Phe	Ser	Gly	Gly	Lys	Asp	Ser	Thr	Tyr	Ala	Leu	Cys	Arg	Val	Val				
	530					535					540								
Asp	Met	Gly	Leu	Arg	Val	Leu	Ala	Tyr	Thr	Leu	Asp	Asn	Gly	Tyr	Ile				
545					550					555					560				
Ser	Asp	Glu	Ala	Lys	Ala	Asn	Val	Asp	Arg	Val	Val	Arg	Glu	Leu	Gly				
			565					570						575					
Val	Asp	His	Arg	Tyr	Leu	Gly	Thr	Pro	His	Met	Asn	Ala	Ile	Phe	Val				
		580						585					590						
Asp	Ser	Leu	His	Arg	His	Ser	Asn	Val	Cys	Asn	Gly	Cys	Phe	Lys	Thr				
	595						600					605							
Ile	Tyr	Thr	Leu	Gly	Ile	Asn	Leu	Ala	His	Glu	Val	Gly	Val	Ser	Asp				
	610					615					620								
Ile	Val	Met	Gly	Leu	Ser	Lys	Gly	Gln	Leu	Phe	Glu	Thr	Arg	Leu	Ser				
625					630					635					640				
Glu	Leu	Phe	Arg	Ala	Ser	Thr	Phe	Asp	Asn	Gln	Val	Phe	Glu	Lys	Asn				
			645					650						655					
Leu	Met	Glu	Ala	Arg	Lys	Ile	Tyr	His	Arg	Ile	Asp	Asp	Ala	Ala	Ala				
			660					665					670						
Arg	Leu	Leu	Asp	Thr	Ser	Cys	Val	Arg	Asn	Asp	Arg	Leu	Leu	Glu	Ser				
	675						680					685							
Thr	Arg	Phe	Ile	Asp	Phe	Tyr	Arg	Tyr	Cys	Ser	Val	Ser	Arg	Lys	Asp				
	690					695					700								
Met	Tyr	Arg	Tyr	Ile	Ala	Glu	Arg	Val	Gly	Trp	Ser	Arg	Pro	Ala	Asp				
705					710				715					720					
Thr	Gly	Arg	Ser	Thr	Asn	Cys	Leu	Leu	Asn	Asp	Val	Gly	Ile	Tyr	Met				
			725					730						735					

His Lys Lys Gln Arg Gly Tyr His Asn Tyr Ser Leu Pro Tyr Ser Trp  
 740 745 750  
 Asp Val Arg Val Gly His Ile Pro Arg Glu Asp Ala Met Arg Glu Leu  
 755 760 765  
 Glu Asp Thr Asp Asp Ile Asp Glu Ala Lys Val Leu Gly Leu Leu Lys  
 770 775 780  
 Gln Ile Gly Tyr Asp Ser Ser Leu Ile Asp Thr Gln Ala Gly Asp Ala  
 785 790 795 800  
 Gln Leu Ile Ala Tyr Tyr Val Ala Ala Glu Glu Leu Asp Pro Val Ala  
 805 810 815  
 Leu Arg Asn Phe Ala Ala Ala Ile Leu Pro Glu Tyr Met Leu Pro Ser  
 820 825 830  
 Tyr Phe Val Arg Leu Asp Arg Met Pro Leu Thr Pro Asn Gly Lys Val  
 835 840 845  
 Asn Arg Arg Ala Leu Pro Arg Pro Glu Leu Lys Lys Asn Ala Ser Glu  
 850 855 860  
 Ala His Thr Glu Pro Ser Ser Ala Leu Glu Gln Glu Leu Val Gln Ile  
 865 870 875 880  
 Trp Lys Glu Val Leu Met Val Asp Lys Val Gly Val Arg Asp Asn Phe  
 885 890 895  
 Phe Glu Leu Gly Gly His Ser Leu Ser Ala Leu Met Leu Leu Tyr Ser  
 900 905 910  
 Ile Ala Glu Arg Tyr Gln Lys Met Val Ser Ile Gln Ala Phe Ser Val  
 915 920 925  
 Asn Pro Thr Ile Glu Gly Leu Ser Glu His Leu Val Ala  
 930 935 940

<210> 30  
 <211> 239  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 30

Met Asp Leu Gln Cys Ala Arg Ile Ala Ala Leu Cys Glu Gln Leu Lys  
 1 5 10 15  
 Leu Ala Arg Leu Ser Ser Asp Trp Gln Ala Leu Ala Gln Ala Ala Ala  
 20 25 30  
 Cys Glu Asp Ala Ser Tyr Phe Leu Glu Lys Val Leu Ala Ser Glu Gln  
 35 40 45  
 Leu Ala Arg Glu Glu Arg Lys Arg Thr Val Leu Thr Arg Leu Ala Arg  
 50 55 60  
 Met Pro Ser Ile Lys Thr Leu Glu Gln Phe Asp Trp Ala Gln Ala Gly

65	70	75	80
Gly Ala Ser Lys	Ala Gln Ile Val	Glu Leu Gly His	Leu Thr Phe Val
	85	90	95
Glu Arg Ala Glu	Asn Val Val Met	Leu Gly Pro Ser	Gly Val Gly Lys
	100	105	110
Thr His Ile Ala	Leu Ala Leu Cys	Gln Arg Ala Val	Met Ala Gly His
	115	120	125
Lys Ala Arg Phe	Ile Thr Ala Ala	Asp Leu Met Met	Gln Leu Ala Ala
	130	135	140
Val Lys Ala Gln	Asn Arg Leu Lys	Asp Tyr Phe Asn	Arg Ala Val Leu
	145	150	155
Gly Pro Lys Leu	Leu Val Val Asp	Glu Ile Gly Tyr	Leu Pro Phe Gly
	165	170	175
Arg Glu Pro Ala	Gln Gly Cys Trp	Ala Ala Thr Gly	Phe Ala Leu Arg
	180	185	190
Ser Leu Ala Ala	Arg Arg Trp Lys	Thr Pro Gly Gly	Ser Asp Leu Leu
	195	200	205
Arg Arg Phe Lys	Gly Lys Trp Val	Lys Phe Lys Ser	Ala Leu Thr Ala
	210	215	220
Asp Val Val Tyr	Leu Ile Phe Arg	Leu Arg Gly Ser	Asp His Pro
	225	230	235
<210> 31			
<211> 286			
<212> PRT			
<213> Xanthomonas albilineans			
<400> 31			
Met Pro Arg Ile	Glu Tyr Cys Ile	Ser Met Met His	Arg Arg Lys Pro
1	5	10	15
Thr Thr Asn Arg	Ser Val Cys Met	Arg Asp Ile Glu	Arg Thr Ala Leu
	20	25	30
Trp Val Ala Gly	Met Arg Ala Leu	Glu Ser Glu Arg	Glu Gln Ala Leu
	35	40	45
Phe His Asp Pro	Phe Ala Arg Arg	Leu Ala Gly Asp	Glu Phe Val Glu
	50	55	60
Glu Leu Arg Arg	Asn Asn Gln Asn	Val Pro Met Pro	Pro Ala Ile Glu
	65	70	75
Val Arg Thr Arg	Trp Leu Asp Asp	Lys Ile Met Gln	Ala Val Ser Glu
	85	90	95
Gly Ile Gly Gln	Val Val Ile Leu	Ala Ala Gly Met	Asp Ala Arg Ala
	100	105	110

Tyr Arg Leu Pro Trp Pro Ser Asp Thr Arg Val Tyr Glu Ile Asp His  
 115 120 125  
 Met Asp Val Leu Ser Asp Lys His Glu Lys Leu His Asp Ala Gln Pro  
 130 135 140  
 Val Cys Gln Arg Ile Ala Leu Pro Ile Asp Leu Arg Glu Asp Trp Pro  
 145 150 155 160  
 Gln Ala Leu Lys Glu Ser Gly Phe Val Gly Ser Ala Ala Thr Leu Trp  
 165 170 175  
 Leu Val Glu Gly Leu Leu Cys Tyr Leu Ser Ala Glu Ala Val Met Leu  
 180 185 190  
 Leu Phe Ala Arg Ile Asp Ala Leu Ser Ala Lys Gly Ser Ser Val Leu  
 195 200 205  
 Phe Asp Val Ile Gly Leu Ser Met Leu Asn Ser Pro Asn Ala Arg Val  
 210 215 220  
 Leu His Ala Met Ala Arg Gln Phe Gly Thr Asp Glu Pro Glu Ser Leu  
 225 230 235 240  
 Ile Gln Pro Leu Gly Trp Glu Pro Gly Val Leu Thr Ile Ala Ala Ala  
 245 250 255  
 Gly Gln Gln Met Gly Arg Trp Pro Phe Pro Val Ala Pro Arg Gly Thr  
 260 265 270  
 His Gly Val Pro Gln Ser Tyr Leu Val His Ala Leu Lys Arg  
 275 280 285

<210> 32  
 <211> 765  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 32

Met Arg Arg Ser Pro Tyr Pro Arg Thr Leu Met Asp Ser Pro Leu Thr  
 1 5 10 15  
 Asn Leu Pro Met His Ser Gly Thr Glu Leu Asp Leu Arg Trp Ser Val  
 20 25 30  
 Gly Gln Thr Arg Pro Gly Arg Asn Glu Ala Tyr Ala Arg Gln Trp Thr  
 35 40 45  
 Thr Leu Leu His Gln Trp Arg Arg Asp Tyr Pro Gly Leu Arg Ile Asp  
 50 55 60  
 Val Ser Asp Thr Pro Ile Gly Gln His Ile Thr Ile Asp Tyr Ala Ala  
 65 70 75 80  
 Pro Tyr Pro Cys Gly Ser Phe Gly Ser Leu Leu Arg Glu Tyr Ala Arg  
 85 90 95  
 Leu Gly Lys Leu Ala Gly Leu Ile Cys Asp Tyr Leu Lys His Arg His  
 100 105 110

Gln Ile Val Leu Ser Glu Ser Pro Pro Gly Ala Asn Thr Leu Ala Leu  
 115 120 125  
 Asp Leu Gly Arg Ile Glu Glu Pro Lys Gln Leu Asp Arg Leu Gln Gly  
 130 135 140  
 Ala Leu Gly Met Ala Leu Glu Ala Leu Ala Thr Arg Arg Ser Asp Gly  
 145 150 155 160  
 Leu Leu Leu Trp His Ala Asp His Arg Gln Arg Asn Leu Pro Asp Leu  
 165 170 175  
 Arg Asp Ser Ala Val Cys Gly Ser Ala Ala Gln Ile Ser Leu Pro Ala  
 180 185 190  
 Leu Ser Cys Val Glu Asp Leu Ile Glu Val Asp Thr Ser Leu Leu Ala  
 195 200 205  
 Cys Asp His Gly Lys Leu Cys Gln Ile Ala Ser His Leu Pro Ala Ser  
 210 215 220  
 Trp Phe Ala Arg Ser Thr Asp Gly Pro Met Pro Ser Trp Ser Asp Ala  
 225 230 235 240  
 Ser Thr Ala Val Phe Ala Cys Ala Pro Ile Gly Phe Leu Pro Ser Val  
 245 250 255  
 Gln Val Asn Val Cys Ala Gln Ile Phe Ser Ala Ala His Leu Ala Ser  
 260 265 270  
 Thr Ala Gln Met Ile Asp Pro Leu Arg Gln Gln Ala Phe Ser Tyr Arg  
 275 280 285  
 Gln Leu Arg Ser Arg Ala Ala Thr Tyr Ala Arg His Leu Ser Leu Leu  
 290 295 300  
 Gly Leu Gln Ser Gly Asp Ala Val Ala Leu Ile Ala Ile Asp Ser Leu  
 305 310 315 320  
 Ala Gly Val Ala Leu Met Leu Ala Cys Leu Ala Gly Gly Leu Val Phe  
 325 330 335  
 Ala Pro Ile Asn Glu Leu Val Ser Leu Val His Phe Glu Thr Thr Leu  
 340 345 350  
 Lys Thr Ile Lys Pro Arg Leu Val Leu Ile Asp Ala Glu Leu Pro Pro  
 355 360 365  
 Ser His His Ala Ala Leu Arg His Leu Pro Thr Leu Glu Leu Thr Ser  
 370 375 380  
 Leu Met Pro Val Ile Glu Asn Asp Glu Leu Val Val Ala Pro Cys Ser  
 385 390 395 400  
 Ala Asp Ala Pro Ala Val Met Ile Cys Thr Ser Gly Ser Thr Gly Thr  
 405 410 415  
 Pro Lys Ala Val Thr His Ser His Ala Asp Phe Met His Cys His Leu  
 420 425 430



Asn Tyr Gln Gln Ala Val Leu Gly Leu Arg Ser Asp Asp Val Met Tyr  
 435 440 445  
 Thr Pro Ser Arg Leu Phe Phe Ala Tyr Gly Leu Asn Asn Leu Met Leu  
 450 455 460  
 Ser Leu Leu Ala Gly Val Ser His Val Ile Ala Ala Pro Leu Ser Val  
 465 470 475 480  
 Arg Gln Ile Ala Gln Thr Ile His Thr Tyr His Val Thr Val Leu Leu  
 485 490 495  
 Ala Val Pro Ala Val Phe Lys Leu Leu Leu Ala Glu Ala Ala Pro Asp  
 500 505 510  
 Ala Val Trp Pro Ala Leu Arg Leu Cys Ile Ser Ala Gly Glu Ser Leu  
 515 520 525  
 Pro Ala Arg Leu Gly His Ala Ile Ser Thr Arg Trp Gln Val Glu Val  
 530 535 540  
 Leu Asp Gly Ile Gly Cys Thr Glu Val Leu Ser Thr Phe Ile Ser Asn  
 545 550 555 560  
 Arg Pro Gly His Ala Leu Met Gly Cys Thr Gly Thr Pro Val Pro Gly  
 565 570 575  
 Phe Val Val Lys Leu Val Asn Lys Gln Gly Glu Ile Cys Arg Ile Gly  
 580 585 590  
 Glu Val Gly Ser Leu Trp Val Arg Gly Asn Thr Leu Thr Arg Gly Tyr  
 595 600 605  
 Val Gly Asp Pro Ile Leu Ser Ala Gln Leu Phe Val Asp Gly Trp Phe  
 610 615 620  
 Asp Thr Arg Asp Leu Phe Phe Ala Asp Ala Lys Gly Arg Phe His Asn  
 625 630 635 640  
 Leu Gly Arg Met Gly Ser Ala Ile Lys Ile Asn Gly Cys Trp Leu Ser  
 645 650 655  
 Pro Glu Thr Leu Glu Ser Val Ile Gln Thr His Ala Cys Val Lys Glu  
 660 665 670  
 Cys Ala Ile Cys Leu Ile Glu Asp Glu Phe Gly Leu Pro Arg Pro Ala  
 675 680 685  
 Ala Phe Val Val Pro Val Asp Ala Ser Ile Asp Thr Gly Ala Leu Trp  
 690 695 700  
 Ala Ala Leu Arg Ala Leu Cys Lys Asn Ala Leu Gly Lys His His Tyr  
 705 710 715 720  
 Pro His Leu Phe Val Glu Val Ser Thr Ile Pro Arg Thr Cys Ser Gly  
 725 730 735  
 Lys Val Ile Arg Pro Ala Leu Leu Glu Thr Leu Ala Ser Ala Lys His  
 740 745 750  
 Leu Gln Ser His Leu Phe Phe Val Gly His Ala Arg Thr

755

760

765

<210> 33  
 <211> 330  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 33

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Met His Thr Asn Ala Asp Leu Pro Leu Thr Ile Lys Ala Asp Ser Ala
1      5      10      15
Glu Ala Thr Leu Thr Asp Trp Asn Ala Thr His Arg Ala Thr Trp Pro
      20      25      30

Thr Leu Leu Trp Gln His Arg Ala Leu Leu Phe Arg Gly Phe Ala His
      35      40      45

Pro Gly Gly Leu Glu Gln Ile Ser Arg Cys Phe Phe Asp Glu Arg Leu
      50      55      60

Ala Tyr Thr Tyr Arg Ser Thr Pro Arg Thr Asp Val Gly Gln His Val
65      70      75      80

Tyr Thr Ala Thr Glu Tyr Pro Arg Gln Leu Ser Ile Ala Gln His Cys
      85      90      95

Glu Asn Ala Tyr Gln Arg Val Trp Pro Met Lys Leu Leu Phe His Cys
      100      105      110

Val Gln Pro Ala Ser Glu Gly Gly Cys Thr Pro Leu Ala Asp Met Leu
      115      120      125

Lys Val Thr Ala Ala Ile Asp Pro Gln Val Arg Glu Ile Phe Ala Arg
      130      135      140

Lys Gln Val Arg Tyr Val Arg Asn Tyr Arg Ala Gly Val Asp Leu Pro
145      150      155      160

Trp Glu Asp Val Phe Asn Thr Arg Asn Lys Gln Glu Val Glu Ala Tyr
      165      170      175

Cys Ala Arg Asn Asp Met Gln Cys Glu Trp Thr Gly Asp Gly Leu Arg
      180      185      190

Thr Ser Gln Ile Cys Arg Ala Phe Ala Cys His Pro Ala Thr Gly Asp
      195      200      205

Glu Val Trp Phe Asn Gln Ala His Leu Phe His Tyr Thr Ala Leu Glu
      210      215      220

Ala Ala Ala Gln Lys Met Met Leu Ser Phe Phe Gly Glu Gln Gly Leu
225      230      235      240

Pro Arg Asn Ala Tyr Phe Gly Asp Gly Thr Pro Ile Asp Pro Ala Met
      245      250      255

Leu Asp His Val Arg Thr Val Phe Ala Gln His Lys Ile His Phe Asp
      260      265      270

Trp His Arg Asp Asp Val Leu Leu Ile Asp Asn Met Leu Val Ser His

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275                      280                      285  
 Gly Arg Glu Pro Tyr Glu Gly Ser Arg Lys Ile Leu Val Cys Met Ala  
 290                      295                      300  
 Glu Pro Tyr Ser Pro Glu Gln Ser Ser Pro Asp Ile Ala Ala Arg Ser  
 305                      310                      315                      320  
 Asp Gly Glu Ala Met Leu Lys Leu His Val  
                     325                      330

<210> 34  
 <211> 1959  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 34

Met Lys Leu Ser Ser Met Ser Leu Leu Asp Ala Glu Asp Val Ala Leu  
 1                      5                      10                      15  
 Thr Ala Ala Ser Pro Asp Thr Ala Leu Ala Leu Asp Trp Ser Arg Ser  
                     20                      25                      30  
 Val Leu Asp Leu Phe Asp Ala Gln Val Ala Leu His Ala Glu Glu Leu  
                     35                      40                      45  
 Ala Cys Ala Asp Gln His Arg Gln Leu Ser Tyr Ala Gln Leu Asp Gln  
                     50                      55                      60  
 His Ala Asn Arg Leu Ala His Cys Leu Ile Glu Arg Gly Leu Arg Pro  
 65                      70                      75                      80  
 Gln Glu Arg Val Ala Leu Trp Phe Gly Arg Ser Pro Asp Phe Leu Ile  
                     85                      90                      95  
 Ala Leu Leu Gly Val Leu Lys Ala Gly Gly Cys Tyr Val Pro Leu Asp  
                     100                      105                      110  
 Pro His Tyr Pro Thr Thr Tyr Ile Gln Gln Ile Leu Asp Asp Ala Gln  
                     115                      120                      125  
 Pro Arg Leu Leu Leu Cys Gly Lys Asp Ile Asp Gly Gln Leu Ile Gln  
                     130                      135                      140  
 Val Pro Arg Leu Arg Leu Asp Asp Ala Ala Ile Ala Arg Gln Pro His  
 145                      150                      155                      160  
 Thr Pro Leu Pro His Ala Leu His Pro Ala Gln Leu Ala Tyr Val Met  
                     165                      170                      175  
 Tyr Thr Ser Gly Ser Thr Gly Arg Pro Lys Gly Val Met Val Pro His  
                     180                      185                      190  
 Arg Gln Ile Leu Asn Trp Leu His Ala Leu Trp Ala Arg Ala Pro Phe  
                     195                      200                      205  
 Glu Ala Gly Glu Arg Val Ala Gln Lys Thr Ser Ile Ala Phe Ala Ile  
                     210                      215                      220

Ser Val Lys Glu Leu Leu Ala Gly Leu Leu Ala Gly Val Pro Gln Val  
 225 230 235 240  
 Phe Ile Asp Glu Asp Thr Val Arg Asp Ile Pro Ala Phe Val Arg Ala  
 245 250 255  
 Leu Glu Thr Trp Gln Ile Thr Arg Leu Tyr Thr Phe Pro Ser Gln Leu  
 260 265 270  
 Asn Ala Leu Leu Asp His Val Ala Glu Thr Pro Gln Arg Leu Ala Arg  
 275 280 285  
 Leu Arg Gln Leu Phe Val Ser Ile Glu Pro Cys Pro Ala Glu Leu Leu  
 290 295 300  
 Gln Arg Leu Arg Thr Leu Leu Pro Ala Cys Thr Ala Trp Tyr Ile Tyr  
 305 310 315 320  
 Gly Cys Thr Glu Ile Asn Asp Met Thr Tyr Cys Asp Pro Ala Glu Gln  
 325 330 335  
 His Ser Gly Ser Gly Phe Val Pro Val Gly Arg Pro Ile Ala Asn Thr  
 340 345 350  
 Lys Val His Val Leu Asp Glu Gln Leu Arg Pro Leu Pro Pro Gly Ile  
 355 360 365  
 Met Gly Glu Val His Ile Glu Ser Leu Gly Ile Thr His Gly Tyr Trp  
 370 375 380  
 Arg Gln Gly Gly Leu Thr Ala Ala Arg Phe Ile Ala Asn Pro Tyr Gly  
 385 390 395 400  
 Pro Pro Gly Ser Arg Leu Tyr Arg Thr Gly Asp Met Ala Arg Leu Leu  
 405 410 415  
 Asp Asn Gly Thr Leu Glu Leu Leu Gly Arg Arg Asp Tyr Glu Val Lys  
 420 425 430  
 Val Arg Gly Tyr Arg Val Asp Val Arg Gln Val Glu Lys Ala Leu Ala  
 435 440 445  
 Ala His Leu Gln Val Ala Glu Ala Ala Val Ile Gly Trp Pro Gln Gly  
 450 455 460  
 Ser Pro Thr Pro Glu Leu Leu Ala Tyr Val Val Pro Arg Gln Gly Val  
 465 470 475 480  
 Leu Asn Leu Asp Glu Leu Arg Lys Leu Leu Gln Glu Arg Leu Pro Thr  
 485 490 495  
 Tyr Met Leu Pro Thr Arg Phe Gln Ser Leu Pro Ala Leu Pro Arg Leu  
 500 505 510  
 Pro Asn Gly Lys Leu Asp Thr Leu Ser Leu Pro Glu Pro Gln Ala Ala  
 515 520 525  
 Ser Ser Asp Ser Asp Tyr Leu Ala Pro Arg Ser Glu Val Glu Ile Thr  
 530 535 540  
 Leu Ala Lys Leu Trp Ser Glu Leu Leu Thr Pro Ala Gln Ala Ala Pro

545		550		555		560
Leu Arg Val Ser	Leu Asn Asp Asn Phe Phe Asn Leu Gly Gly His Ser					
	565			570		575
Leu Leu Ala Thr	Gln Leu Phe Ser Arg Ile Arg Gln Ser Phe Asp Ile					
	580		585			590
Glu Val Arg Val	Asn Thr Leu Phe Glu Ser Pro Val Leu Glu Asp Phe					
	595		600			605
Ala Arg Val Val	Asn Glu Ala Arg Gln Gln Gln Ala Pro Thr Gly Gly					
	610		615		620	
Asn Thr Ile Ser	Ser Arg Ala Val Arg Asp Ala Pro Val Pro Leu Ser					
	625		630		635	640
Tyr Gln Gln Glu	Arg Leu Trp Phe Val His Glu His Met Pro Glu Gln					
	645		650			655
Arg Thr Ser Tyr	Asn Val Ala Phe Ala Cys His Leu Arg Ser Ala Asp					
	660		665			670
Phe Ser Met Ser	Ala Leu Arg Glu Ala Ile Gln Ala Leu Val Ala Arg					
	675		680			685
His Glu Thr Leu	Arg Thr Arg Ile Ala Thr Cys Ala Gly Gly Asp Tyr					
	690		695		700	
Pro Ser Gln His	Ile Ala Asp Ala Met Gln Val Pro Val Pro Cys Ile					
	705		710		715	720
Thr Ala Thr Pro	Ala Glu Val Pro Arg Leu Val Ala Glu His Ala Ala					
	725		730			735
His Val Phe Asp	Leu Ala His Gly Pro Leu Leu Lys Val Ser Val Leu					
	740		745			750
Arg Val Ser Asp	Asp Tyr His Val Phe Leu Met Asn Met His His Ile					
	755		760			765
Ile Cys Asp Gly	Trp Ser Ile Asn Leu Ile Phe His Asp Leu Arg Ala					
	770		775		780	
Phe Tyr Ile Ala	Ala Leu Gln Gln Thr Pro Pro Ala Leu Pro Pro Leu					
	785		790		795	800
Leu Leu Gln Tyr	Ala Asp Tyr Ala Thr Trp Gln Arg Val Gln Asp Phe					
	805		810			815
Ser Ala Asp Leu	Asp Tyr Trp Lys Gln Arg Leu His Gly Tyr Glu Glu					
	820		825			830
Gly Leu Ala Leu	Pro Tyr Asp Phe Pro Arg Pro Ala Asn Arg Ala Trp					
	835		840			845
Arg Ala Gly Ile	Leu His Leu Thr Tyr Pro Asp Ala Leu Ala Ala Arg					
	850		855		860	
Leu Ala Ala Phe	Ser Gln Glu Arg Arg Val Thr Leu Phe Met Thr Leu					
	865		870		875	880

Met Ala Ser Leu Ala Ile Val Leu His Gln Tyr Thr Gly Arg Arg Glu  
 885 890 895  
 Leu Cys Leu Gly Thr Thr Ser Ala Gly Arg Asp Gln Leu Glu Thr Glu  
 900 905 910  
 Asn Leu Ile Gly Phe Phe Val Asn Ile Leu Ala Val Arg Leu Asn Leu  
 915 920 925  
 Gly Ser His Ala Phe Ala Glu Asp Phe Leu Gln His Val Arg Gln Gln  
 930 935 940  
 Val Leu Asp Ala Tyr Ala His Arg Ala Leu Pro Phe Glu His Val Leu  
 945 950 955 960  
 Ser Ala Leu Lys Lys Pro Arg Asp Ser Ser Gln Ile Pro Leu Val Pro  
 965 970 975  
 Ile Met Leu Arg His Gln Asn Phe Ala Thr Glu Gly Val Asn Ala Phe  
 980 985 990  
 Ala Gln Ile Phe Leu Ser Ala Gln Met Glu Phe Gly Glu Arg Thr Thr  
 995 1000 1005  
 Pro Asn Glu Leu Asp Leu Gln Phe Ile Gly Asp Gly Ser His Leu  
 1010 1015 1020  
 Glu Val Thr Val Glu Tyr Ala Ala Glu Leu Phe Ser Ala Ala Thr  
 1025 1030 1035  
 Val Gln Arg Met Leu Ala His His Gln Arg Val Leu Glu Arg Met  
 1040 1045 1050  
 Leu Glu Glu Pro Arg Cys Arg Leu Ser Asp Phe Ser Leu Pro Val  
 1055 1060 1065  
 Ala Arg Thr Glu Phe Thr Pro His Thr Leu Asp Thr Ser Arg Ser  
 1070 1075 1080  
 Val Leu Asp Leu Phe Asp Ala Gln Val Ala Leu His Ala Glu Glu  
 1085 1090 1095  
 Leu Ala Cys Ala Asp Gln His Arg Gln Leu Ser Tyr Ala Gln Leu  
 1100 1105 1110  
 Asp Gln His Ala Asn Arg Leu Ala His Cys Leu Ile Glu Arg Gly  
 1115 1120 1125  
 Leu Arg Pro Gln Glu Arg Val Ala Leu Trp Phe Gly Arg Ser Pro  
 1130 1135 1140  
 Asp Phe Leu Ile Ala Leu Leu Gly Val Leu Lys Ala Gly Gly Cys  
 1145 1150 1155  
 Tyr Val Pro Leu Asp Pro His Tyr Pro Thr Thr Tyr Ile Gln Gln  
 1160 1165 1170  
 Ile Leu Asp Asp Ala Gln Pro Arg Leu Leu Leu Cys Gly Lys Asp  
 1175 1180 1185

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Val	Ala	Glu	Ala	Ala	Val	Ile	Gly	Trp	Pro	Gln	Gly	Ser	Pro	Thr
1505						1510					1515			
Pro	Glu	Leu	Leu	Ala	Tyr	Val	Val	Pro	Arg	Gln	Gly	Val	Leu	Asn
1520						1525					1530			
Leu	Asp	Glu	Leu	Arg	Lys	Leu	Leu	Gln	Glu	Arg	Leu	Pro	Thr	Tyr
1535						1540					1545			
Met	Leu	Pro	Thr	Arg	Phe	Gln	Ser	Leu	Pro	Ala	Leu	Pro	Arg	Leu
1550						1555					1560			
Pro	Asn	Gly	Lys	Leu	Asp	Thr	Leu	Ser	Leu	Pro	Glu	Pro	Gln	Ala
1565						1570					1575			
Ala	Ser	Ser	Asp	Ser	Asp	Tyr	Leu	Ala	Pro	Arg	Ser	Glu	Val	Glu
1580						1585					1590			
Ile	Thr	Leu	Ala	Lys	Leu	Trp	Ser	Glu	Leu	Leu	Thr	Pro	Ala	Gln
1595						1600					1605			
Ala	Ala	Pro	Leu	Arg	Val	Ser	Leu	Asn	Asp	Asn	Phe	Phe	Asn	Leu
1610						1615					1620			
Gly	Gly	His	Ser	Leu	Leu	Ala	Thr	Gln	Leu	Phe	Ser	Arg	Ile	Arg
1625						1630					1635			
Gln	Ser	Phe	Asp	Ile	Glu	Val	Arg	Val	Asn	Thr	Leu	Phe	Glu	Ser
1640						1645					1650			
Pro	Val	Leu	Glu	Asp	Phe	Ala	Ala	Val	Val	Glu	Arg	Gly	Met	Arg
1655						1660					1665			
Gln	Ser	Gln	Ala	Gly	Ser	Met	Pro	Val	Ser	Leu	Ile	Val	Pro	Leu
1670						1675					1680			
Ser	Leu	Arg	Thr	Glu	Arg	Ala	Ala	Val	Tyr	Ala	Ile	His	Pro	Ile
1685						1690					1695			
Gly	Gly	Gln	Ile	His	Cys	Tyr	Ile	Asp	Leu	Ala	Ala	Ala	Leu	Gly
1700						1705					1710			
His	Ser	Ala	Arg	Val	Tyr	Gly	Leu	Gln	Cys	Glu	Pro	Val	Arg	Arg
1715						1720					1725			
Phe	Ala	His	Leu	Ser	Asp	Leu	Ala	Ala	His	Tyr	Cys	Asp	Ala	Leu
1730						1735					1740			
Leu	Ala	Gly	Pro	Thr	Gly	Ala	Pro	Tyr	Arg	Leu	Leu	Gly	Trp	Ser
1745						1750					1755			
Ser	Gly	Gly	Val	Leu	Ala	Leu	Ala	Val	Ala	Glu	Gln	Leu	Gln	Arg
1760						1765					1770			
Arg	Gly	Leu	Arg	Val	Asp	Tyr	Val	Gly	Leu	Leu	Asp	Ser	Ser	Leu
1775						1780					1785			
Ile	Pro	Val	His	Ala	Arg	Glu	Pro	Arg	Gln	Leu	Thr	Phe	Val	Ala
1790						1795					1800			



Ala Leu Asn Thr Leu Ala Ala Leu Ala Lys Arg Gly Phe Glu Gln  
 1805 1810 1815

Ala Glu Ile Asp Glu Ala Arg Gln Leu Leu Phe Ala Asp Gly Asp  
 1820 1825 1830

Asp Glu His Val Phe Asp Tyr Ser Arg His Gln Ala Ser Leu Asp  
 1835 1840 1845

Lys Leu Leu Ala His Leu Arg Phe Thr Leu Glu Ser Arg Met Trp  
 1850 1855 1860

Pro Pro Leu Ala Glu Gln Leu Arg Val Thr Arg Tyr His Leu Gly  
 1865 1870 1875

Leu Leu Ala Gly Phe Glu Pro Gln Cys Leu Gln Pro Asn Ala His  
 1880 1885 1890

Leu Tyr Gln Ala Gln Thr Ala Val His Val Ser Tyr Ala Asp Met  
 1895 1900 1905

Ser Lys Pro Arg Gly Gly Ser Glu Val Leu Pro Asp Ile Thr Gly  
 1910 1915 1920

Tyr Val Pro Leu Ser Gln Ile Lys Ser Ala Ala Gly Asn His Tyr  
 1925 1930 1935

Ser Met Leu Gln Gly Asp Pro Leu Arg Glu Leu Ala Arg Met Leu  
 1940 1945 1950

Val Thr Asp Leu Asp Ala  
 1955

<210> 35  
 <211> 83  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 35

Met Thr Phe Glu Glu Gln Ala Tyr Leu Val Leu Ile Asn Asp Glu Leu  
 1 5 10 15

Gln Tyr Ser Leu Trp Pro Ser Asp Leu Glu Val Pro Pro Gly Trp Arg  
 20 25 30

Lys Glu Gly Tyr Ala Gly Gly Lys Asp Glu Cys Met Ala Tyr Ile Asp  
 35 40 45

Glu Thr Trp Thr Asp Met Arg Pro Leu Ser Leu Arg Glu Leu Asp Asp  
 50 55 60

Lys Asn Leu Gly Asp Ala Ser Ser Pro Asp Gly Ser Gly Phe Glu Ser  
 65 70 75 80

Ser Tyr Ser

<210> 36

<211> 315  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 36

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Met Gly Cys Ala Cys Leu Pro His Tyr Leu Glu Lys Gln Asp Leu Ser
1           5           10           15

Ala Leu Asp Asp Ala Leu Ala Gly Val Arg Leu Ser Gln Tyr Cys Thr
20           25           30

Thr Asp Gly Arg Gln Leu Glu Leu Tyr Trp Leu Gly Ala Gln Ala Ser
35           40           45

Pro Lys Leu Val Leu Leu Pro Pro Tyr Gly Met Ser Tyr Leu Leu Leu
50           55           60

Ser Arg Leu Ala Gln Arg Leu Ala Arg His Phe His Val Leu Cys Trp
65           70           75           80

Glu Ser Ile Gly Cys Pro Asn Ala Gln Thr Ser Val Thr Ala Glu Asp
85           90           95

Phe Asp Leu Asp Arg Gln Ala Ala Thr Leu Leu Gly Ile Leu His Gln
100          105          110

His Asp Tyr Ala Asp Cys His Phe Val Gly Trp Cys Gln Ala Ala Gln
115          120          125

Leu Ala Val His Ala Ile Ala Leu His Gly Phe Ala Pro Arg Ser Met
130          135          140

Ala Trp Val Ala Pro Ala Gly Leu Leu Pro Pro Ile Val Lys Ser Glu
145          150          155          160

Phe Glu Arg Cys Ala Leu Pro Ile Tyr Leu Gln Ile Glu Arg His Gly
165          170          175

Leu Glu Gln Ala Lys Lys Leu Ala Ala Ile Leu Asp Lys Tyr Arg Gly
180          185          190

Gln Pro Leu Arg Gly Asp Asp Leu Ala Glu Lys Leu Thr Met Leu His
195          200          205

Leu Ala Asp Pro Ala Ser Thr Leu Val Phe Ser Arg Tyr Met Arg Ala
210          215          220

Tyr Glu Glu Asn Lys Gln Ser Val Gln Ala Leu Leu Pro Thr Ala Leu
225          230          235          240

Gly Arg His Pro Thr Leu Ile Val His Cys Lys Asp Asp Ser Phe Ser
245          250          255

His Tyr Ser Ala Ser Val Gln Leu Ala Arg His Asp Pro Ser Leu Arg
260          265          270

Leu Asp Leu Leu Asp His Gly Gly His Leu Gln Leu Phe Asn Asp Pro
275          280          285

Gly Ala Val Ala Gln Arg Ile Ile Asp Phe Ile Gly Leu Thr Val Gly

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290

295

300

Glu Val Ala Pro Thr Ser Met His Ser Ala Ala  
 305 310 315

&lt;210&gt; 37

&lt;211&gt; 451

&lt;212&gt; PRT

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 37

Met Tyr Ile Pro Asn Asn Ile Asp Leu Asp Pro His Ser Ala Leu Val  
 1 5 10 15

Arg Gln Leu Thr Ser Tyr Gln Val Arg Phe Leu Gln Trp Trp Arg Leu  
 20 25 30

Arg Gly Pro Ser Glu Phe His Asp Arg Glu Met Asn Leu Arg Met Pro  
 35 40 45

Thr Gly Gly Val Lys Gly Ser Glu Trp Thr Arg Tyr His Arg Met Arg  
 50 55 60

Pro Ser Asp Tyr Arg Trp Gly Val Phe Met Met Pro Pro Asp Arg Asn  
 65 70 75 80

Thr Val Val Phe Gly Glu Arg Lys Gly Gln Val Ala Trp Ser Cys Val  
 85 90 95

Pro Glu Glu Tyr Arg Asp Leu Leu Leu Asp His Val Thr Val Gln Gly  
 100 105 110

Asp Val Glu Asn Ala Ala Val Glu Gln Ser His Glu Leu Thr Gln Met  
 115 120 125

Val Pro Ser Ala Ile Asp Leu Glu His Leu Phe Gln Phe Phe Leu Glu  
 130 135 140

Glu Gly Arg His Thr Trp Ala Met Ser His Leu Leu Ile Glu Tyr Phe  
 145 150 155 160

Gly Ser Asp Gly Ala Asp Ala Ala Glu Gly Leu Leu Gln Arg Met Ser  
 165 170 175

Gly Asp Ala Gln Asn Pro Arg Leu Leu Asp Ala Phe Asn Tyr His Thr  
 180 185 190

Glu Asp Trp Leu Ser His Phe Met Trp Cys Phe Phe Ala Asp Arg Val  
 195 200 205

Gly Lys Tyr Gln Ile Gln Ala Val Thr Gln Ser Ala Phe Leu Pro Leu  
 210 215 220

Ala Arg Thr Ala Arg Phe Met Met Phe Glu Glu Pro Leu His Ile Lys  
 225 230 235 240

Phe Gly Val Asp Gly Leu Glu Arg Val Leu Tyr Arg Ser Ala Glu Ile  
 245 250 255

Thr Leu Arg Glu Asp Thr His Ala Ile Phe Asp Ala Gly Ala Ile Pro  
 260 265 270  
 Leu Pro Val Val Gln Lys Tyr Leu Asn Tyr Trp Leu Pro Lys Ile Phe  
 275 280 285  
 Asp Leu Phe Gly His Asp Val Ser Glu Arg Ser Arg Val Leu Tyr Gln  
 290 295 300  
 Ala Gly Ile Arg Ser Pro Arg Asn Phe Asp Lys Leu Glu Gly Thr Glu  
 305 310 315 320  
 Val Ala Val Asp Val Arg Cys Glu Asp Arg Leu Val Ser Ser Thr Ala  
 325 330 335  
 Pro Ala Glu Leu Ala Ile Asn Ala Val Met Arg Arg Gln Tyr Ile Ala  
 340 345 350  
 Glu Val Gly Ala Ile Ile Gly Arg Trp Asn Gln Gln Leu Arg Arg Leu  
 355 360 365  
 Gly Leu Ala Phe Glu Leu Gln Leu Pro His Glu Arg Phe His Arg Asp  
 370 375 380  
 Phe Gly Pro Cys Lys Gly Leu Ala Phe Asp Leu Asp Gly Asn Pro Val  
 385 390 395 400  
 His Asp Ala Asp Gly Gln Arg Leu Ala Ala Leu Leu Pro Thr Pro Gln  
 405 410 415  
 Asp Leu Ala Gly Val Arg Gly Leu Met Gly Arg Glu Leu Gly Glu Gly  
 420 425 430  
 Arg Thr Ala Val Trp Leu Ala Pro Ala Gly Ala Ser Leu Asp Lys Leu  
 435 440 445  
 Met Pro Ala  
 450

<210> 38  
 <211> 317  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 38

Met Asn Ser Tyr Val Gly Cys Gln Lys Leu Glu Thr Asp Gly Asp Ala  
 1 5 10 15  
 Ser Arg Val Val Pro Met Trp Val Met Tyr Pro Thr Ala Thr Pro Ser  
 20 25 30  
 Arg Asp Thr Ala Met Gly Pro Tyr Thr Leu Asp Val Ala Leu Gly Ala  
 35 40 45  
 Pro Ile Glu Ala Gly Pro Phe Pro Leu Ala Val Ile Ser His Gly Thr  
 50 55 60  
 Arg Ser Ala Gly Leu Val Phe Arg Thr Leu Ala His Tyr Leu Ala Arg  
 65 70 75 80

His Gly Phe Ile Val Ala Leu Pro Glu His Pro Gly Asp Asn Leu Phe  
 85 90 95  
 Gln His Gln Leu Glu Tyr Ser Tyr Gln Asn Leu Glu Asp Arg Pro Arg  
 100 105 110  
 His Ile Arg Ala Val Ile Asp Thr Leu Thr Gly His Ala Gln Phe Gly  
 115 120 125  
 Pro Ala Ile Gln Ala His Asn Val Ala Val Ile Gly His Ser Val Gly  
 130 135 140  
 Gly Tyr Thr Ala Leu Ala Ile Ala Gly Gly Glu Pro His Thr Gly Phe  
 145 150 155 160  
 Met Val Asp Phe Ala His Arg Pro Glu His Ala Glu Gln Pro Ala Trp  
 165 170 175  
 Thr Ala Leu Val Arg Gln Asn Arg Val Pro Ile Arg Ala Val Pro Val  
 180 185 190  
 Thr Ala Asp Pro Arg Val Arg Ala Val Val Ala Leu Ala Pro Asp Phe  
 195 200 205  
 Ser Leu Tyr Met His Glu Asp Ala Leu Ala Lys Val Glu Val Pro Val  
 210 215 220  
 Leu Leu Ile Val Gly Glu Lys Asp Gln Trp Ala His Glu Thr Ile Val  
 225 230 235 240  
 Ala Thr Arg Thr Ala Leu Gly Asn Asp Gly Arg Leu Glu Ala Arg Val  
 245 250 255  
 Val Pro Asn Ala Gly His Tyr Ala Phe Ile Ser Val Phe Pro Glu Ala  
 260 265 270  
 Met Lys Ala Arg Val Gly Glu Ala Ala Ile Asp Pro Pro Gly Phe Asp  
 275 280 285  
 Arg Ser Ala Phe Gln Arg Glu Leu Glu Arg Asp Ile Leu His Phe Leu  
 290 295 300  
 Thr Val Thr Met Arg Pro Ala Glu Ala Ala Ile Ser Gly  
 305 310 315

&lt;210&gt; 39

&lt;211&gt; 496

&lt;212&gt; PRT

&lt;213&gt; Xanthomonas albilineans

&lt;400&gt; 39

Met Gln Lys Pro Lys Glu Ala Leu Gly Met Pro Pro Gly Met Ala Pro  
 1 5 10 15  
 Pro Gly Ala Gln Phe Asp Tyr Arg Trp Arg Trp Pro Ala Met Ile Val  
 20 25 30  
 Leu Leu Ser Ala Asn Phe Met Asn Leu Leu Asp Val Gly Ile Val Asn  
 35 40 45

Val Ala Leu Pro Ser Ile Gln Lys Asn Leu Gly Ala Asp Glu Gln Gln  
 50 55 60  
 Leu Glu Trp Ile Val Ala Ile Tyr Ile Leu Leu Phe Ala Leu Gly Leu  
 65 70 75 80  
 Leu Pro Leu Gly Arg Leu Gly Asp Met Leu Gly Arg Lys Arg Met Phe  
 85 90 95  
 Gly Thr Gly Val Ala Gly Phe Ile Leu Met Ser Ala Phe Cys Ala Ile  
 100 105 110  
 Ala Gly Asn Ile His Val Leu Ile Ile Ala Arg Ala Leu Gln Gly Leu  
 115 120 125  
 Ala Ala Ala Met Leu Ala Pro Gln Val Met Ala Ile Ala Gln Thr Met  
 130 135 140  
 Phe Ala Pro Lys Glu Arg Ala Ala Ala Phe Ser Leu Phe Gly Leu Val  
 145 150 155 160  
 Ala Gly Leu Ala Ser Phe Ala Gly Pro Leu Val Ser Gly Leu Leu Ile  
 165 170 175  
 His Ile Asp Ala Phe Gly Val Gly Trp Arg Ala Ile Phe Leu Ile Asn  
 180 185 190  
 Val Pro Ile Gly Leu Val Thr Leu Leu Ala Ala Ala Ile Trp Val Pro  
 195 200 205  
 Lys Val Pro Ala His Ala Gly Ile His Asn Asp Trp Val Gly Ile Ala  
 210 215 220  
 Leu Ala Ala Leu Ala Leu Leu Cys Leu Val Phe Pro Leu Ile Glu Gly  
 225 230 235 240  
 Arg Ala Tyr Gly Trp Pro Leu Trp Cys Phe Ala Ala Ile Ala Leu Gly  
 245 250 255  
 Ile Pro Leu Leu Val Ala Phe Val Ala Trp Gln Arg Arg Gln Ala His  
 260 265 270  
 Leu Ala Arg Pro Ala Leu Leu Pro Ile Tyr Leu Met Ser His Arg Asp  
 275 280 285  
 Tyr Ile Leu Gly Ala Leu Ser Val Ser Val Phe Tyr Ser Ala Leu Gln  
 290 295 300  
 Gly Phe Phe Leu Val Phe Val Ile Phe Leu Gln Gln Gly Leu Ala Tyr  
 305 310 315 320  
 Ser Ala Leu Glu Thr Gly Val Ala Thr Thr Pro Phe Pro Val Gly Val  
 325 330 335  
 Ala Ile Ala Ser Met Leu Ala Arg His Val Glu Ser Leu Arg Ala Lys  
 340 345 350  
 Ile Phe Ser Gly Ala Cys Leu Met Ile Ala Ser Tyr Leu Ala Leu Trp  
 355 360 365

Val Ile Ile Thr Arg Ser Glu Gly Ser Leu Asp Pro Trp Thr Leu Thr  
 370 375 380  
 Leu Pro Leu Leu Ile Gly Gly Leu Gly Cys Gly Ile Thr Ile Ala Ser  
 385 390 395 400  
 Leu Phe Gln Thr Val Met Arg Thr Val Pro Leu Lys Asp Ala Gly Ala  
 405 410 415  
 Gly Ser Gly Ala Leu Gln Val Ile Gln Gln Val Gly Gly Met Leu Gly  
 420 425 430  
 Ile Ala Leu Val Ser Glu Ile Phe Phe Ser Gly Leu His Gln His Leu  
 435 440 445  
 Gln Gly Pro Ala Gly Val Ala Leu Ala Phe Lys Gln Ala Phe Gly Ala  
 450 455 460  
 Thr Val Val Tyr Tyr Ile Ala Ala Asn Ala Phe Val Ala Leu Ser Thr  
 465 470 475 480  
 Leu Gly Leu Gln Phe Lys Leu Thr Gln Phe Ala Pro Gln Ser Ser Pro  
 485 490 495

<210> 40  
 <211> 584  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 40

Met Lys Arg Thr Tyr Ile Gly Leu Ala Asn Ser Phe His Asp Ser Ala  
 1 5 10 15  
 Ile Ala Ile Val Gly Asp Asp Gly Gln Val Arg Phe Ala Glu Ala Thr  
 20 25 30  
 Glu Arg Tyr Leu Gln Tyr Lys Arg Ser Ile Gly Val Ala Pro Asp Val  
 35 40 45  
 Phe Gln Arg Ala Ile Lys Leu Val His Glu Tyr Gly Asp Pro Gly Ala  
 50 55 60  
 Glu Leu Val Val Ala Thr Ser Trp Ser Gly Gln Thr Pro Glu Leu Met  
 65 70 75 80  
 Arg Glu Gly Leu Gly Lys Thr Ala Gln Ala Val Asp Gln Tyr Arg Ser  
 85 90 95  
 Ala Phe Gly Asp Leu Pro Trp His Val Asn Lys Gln Phe Val Ala Gln  
 100 105 110  
 Ser Phe Phe Tyr Arg Ser Gln Leu Ala Met Val Glu His Pro Gly His  
 115 120 125  
 Leu Leu Glu Tyr Asp Leu Ser His Met Ala Glu Pro Ala Phe Lys Pro  
 130 135 140  
 Pro Ser Tyr Arg His Tyr Glu His His Leu Thr His Ala Val Ala Gly  
 145 150 155 160

Cys	Tyr	Thr	Ser	Pro	Phe	Glu	Glu	Ala	Val	Cys	Ala	Val	Leu	Asp	Gly	
				165					170					175		
Met	Gly	Glu	Lys	Asn	Ala	Leu	Ala	Cys	Tyr	His	Tyr	Gln	Gln	Gly	Lys	
			180					185					190			
Leu	Thr	Pro	Ile	His	Gln	Ser	Glu	Thr	Ser	Ser	Trp	Ala	Ser	Leu	Gly	
		195					200					205				
Phe	Phe	Tyr	Gly	Met	Ile	Cys	Glu	Val	Cys	Gly	Phe	Gly	Thr	Leu	Ser	
	210					215					220					
Gly	Glu	Glu	Trp	Lys	Val	Met	Gly	Leu	Ala	Ala	Tyr	Gly	Gln	His	Asp	
225					230					235					240	
Arg	Gln	Leu	Tyr	Glu	Leu	Leu	Arg	Gln	Met	Leu	Arg	Val	Asp	Gly	Leu	
				245					250					255		
Thr	Leu	Arg	Phe	Ala	Pro	Ala	Ala	Gln	Phe	Ser	Gln	Leu	Gln	Arg	Thr	
			260					265					270			
Leu	Tyr	Ala	Met	Arg	Arg	Cys	Lys	Gly	Gln	Pro	Thr	Ile	Glu	Leu	Ala	
		275					280					285				
Asn	Leu	Ala	Tyr	Ala	Gly	Gln	Gln	Val	Phe	Cys	Asp	Val	Leu	Phe	Glu	
	290					295					300					
Phe	Leu	His	Asn	Leu	His	Ala	Leu	Gly	Leu	Ser	Asp	His	Leu	Val	Leu	
305					310					315					320	
Gly	Gly	Gly	Cys	Ala	Leu	Asn	Ser	Ser	Ala	Asn	Gly	Arg	Val	Leu	Ala	
				325					330					335		
Glu	Thr	Pro	Phe	Arg	His	Leu	His	Val	Phe	Ala	Ala	Pro	Gly	Asp	Asp	
			340					345					350			
Gly	Asn	Ala	Val	Gly	Ala	Ala	Leu	Trp	Ala	His	Ala	Glu	Asp	His	Pro	
	355						360					365				
Glu	Gln	Thr	Pro	Pro	Ala	Ala	Arg	Glu	Gln	Ser	Pro	Tyr	Leu	Gly	Ser	
	370					375					380					
Ser	Met	Ser	Ala	Glu	Thr	Leu	His	Asn	Val	Glu	Arg	Phe	Gly	Ala	Leu	
385					390					395					400	
Ser	Lys	Phe	Thr	Arg	Cys	Leu	Asp	Asp	Ala	Ala	Gln	Arg	Ala	Ala	Arg	
				405					410					415		
Leu	Leu	Thr	Glu	Gly	Lys	Ile	Val	Ala	Trp	Val	Gln	Gly	Arg	Ala	Glu	
			420					425					430			
Phe	Gly	Pro	Arg	Ala	Leu	Gly	Asn	Arg	Ser	Ile	Leu	Ala	Asp	Pro	Arg	
		435					440					445				
Ser	Pro	Ala	Ile	Lys	Asp	Ile	Ile	Asn	Ala	Arg	Val	Lys	Phe	Arg	Glu	
	450					455					460					
Glu	Phe	Arg	Pro	Phe	Ala	Pro	Ser	Ile	Leu	His	Glu	His	Gly	Ala	Glu	
465					470					475					480	



Tyr Phe Glu Leu Tyr Gln Glu Ser Pro Tyr Met Glu Arg Thr Leu Lys  
                             485                            490                            495  
 Phe Arg Ala Glu Ala Thr Arg Lys Val Pro Gly Val Val His His Asp  
                             500                            505                            510  
 Gly Thr Gly Arg Leu Gln Thr Val Lys Gln His Trp Asn Pro Arg Tyr  
                             515                            520                            525  
 His Ala Leu Ile Lys Glu Phe Tyr Arg Leu Thr Gly Ile Pro Leu Val  
                             530                            535                            540  
 Leu Asn Thr Ser Phe Asn Val Met Gly Lys Pro Ile Ala His Ser Val  
                             545                            550                            555                            560  
 Glu Asp Ala Leu Ser Ile Phe Phe Thr Ser Gly Leu Asp Ala Met Phe  
                             565                            570                            575  
 Ile Asp Asp Val Leu Ile Glu Lys  
                             580

<210> 41  
 <211> 88  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 41

Met Arg Thr Ser Lys Phe Asn Glu Thr Gln Ile Ile Ala Thr Leu Lys  
 1                            5                            10                            15  
 Gln Ala Asp Ala Gly Val Pro Val Lys Asp Ile Cys Arg Gln Val Gly  
                             20                            25                            30  
 Ile Ser Thr Ala Thr Tyr Tyr Gln Trp Lys Ser Lys Tyr Val Ala Ser  
                             35                            40                            45  
 Glu Met Pro Ser Ser Arg His Thr Ser Leu Thr Trp Arg Pro Pro Ser  
                             50                            55                            60  
 Thr Cys Phe Ser Val Ala Thr Ile Trp Leu Ser Val Asn Leu Leu Leu  
 65                            70                            75                            80  
 Arg Ile Val Gly Arg Leu Gly Gly  
                             85

<210> 42  
 <211> 716  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 42

Met Arg Cys Leu Ile Ile Asn Asn Tyr Asp Ser Phe Thr Trp Asn Leu  
 1                            5                            10                            15  
 Ala Asp Tyr Val Ala Gln Ile Phe Gly Glu Asp Pro Leu Val Val His  
                             20                            25                            30

Asn	Asp	Glu	Tyr	Ser	Trp	His	Glu	Leu	Lys	Asp	Arg	Gly	Gly	Phe	Ser	35	40	45
Ser	Ile	Ile	Val	Ser	Pro	Gly	Pro	Gly	Ser	Val	Val	Asn	Glu	Ala	Asp	50	55	60
Phe	His	Ile	Ser	Leu	Gln	Ala	Leu	Glu	Gln	Asn	Glu	Phe	Pro	Val	Leu	65	70	75
Gly	Val	Cys	Leu	Gly	Phe	Gln	Gly	Leu	Ala	His	Val	Tyr	Gly	Gly	Arg	85	90	95
Ile	Leu	His	Ala	Pro	Val	Pro	Phe	His	Gly	Arg	Arg	Ser	Thr	Val	Ile	100	105	110
Asn	Thr	Gly	Asp	Gly	Leu	Phe	Glu	Gly	Ile	Pro	Gln	Arg	Phe	Glu	Ala	115	120	125
Val	Arg	Tyr	His	Ser	Leu	Met	Val	Cys	Gln	Gln	Ser	Leu	Pro	Pro	Val	130	135	140
Leu	Lys	Val	Thr	Ala	Arg	Thr	Asp	Cys	Gly	Val	Val	Met	Gly	Leu	Gln	145	150	155
His	Val	Gln	His	Pro	Lys	Trp	Gly	Val	Gln	Phe	His	Pro	Glu	Ser	Ile	165	170	175
Leu	Thr	Glu	His	Gly	Lys	Arg	Ile	Val	Ala	Asn	Phe	Ala	Lys	Leu	Ala	180	185	190
Ala	Arg	His	Ser	Ala	Pro	Leu	Leu	Ala	Gly	Ser	Glu	Gln	Ala	Gly	Lys	195	200	205
Val	Leu	Ser	Val	Cys	Ala	Pro	Glu	Met	Val	Thr	Pro	Arg	Val	Arg	Arg	210	215	220
Met	Leu	Ser	Arg	Lys	Ile	Lys	Cys	Arg	Trp	Gln	Ala	Glu	Asp	Val	Phe	225	230	235
Leu	Ala	Leu	Phe	Ala	Asp	Glu	Lys	His	Cys	Phe	Trp	Leu	Asp	Ser	Gln	245	250	255
Leu	Val	Cys	Ser	Pro	Met	Ala	Arg	Tyr	Ser	Phe	Met	Gly	Ala	Val	Asn	260	265	270
Glu	Ser	Glu	Val	Val	Arg	His	Cys	Val	Arg	Pro	Gly	Ser	Met	Val	Gln	275	280	285
Glu	Ala	Gly	Glu	Arg	Phe	Leu	Ala	Glu	Met	Asp	Arg	Ala	Leu	Gln	Ser	290	295	300
Val	Leu	Thr	Glu	Asp	Val	Ala	Glu	Arg	Pro	Pro	Phe	Ala	Phe	Arg	Gly	305	310	315
Gly	Tyr	Val	Gly	Tyr	Met	Ser	Tyr	Glu	Met	Lys	Ser	Val	Phe	Gly	Ala	325	330	335
Pro	Ala	Ser	His	Ala	Asn	Ala	Ile	Pro	Asp	Ala	Leu	Trp	Met	Arg	Val	340	345	350
Glu	Arg	Phe	Val	Ala	Phe	Asp	His	Ala	Thr	Glu	Glu	Val	Trp	Leu	Leu			

355					360					365					
Ala	Leu	Ala	Asp	Thr	Glu	Asp	Leu	Ser	Ala	Leu	Ala	Trp	Leu	Asp	Ala
370					375					380					
Ile	Glu	Gln	Arg	Ile	His	Ala	Ile	Gly	Gln	Ala	Ala	Pro	Ala	Cys	Ile
385					390					395					400
Ser	Leu	Gly	Leu	Arg	Ser	Met	Glu	Ile	Glu	Leu	Asn	His	Gly	Arg	Arg
				405					410					415	
Gly	Tyr	Leu	Glu	Ala	Ile	Glu	Arg	Cys	Lys	Gln	Arg	Ile	Val	Asp	Gly
			420					425					430		
Glu	Ser	Tyr	Glu	Ile	Cys	Leu	Thr	Asp	Leu	Phe	Ser	Phe	Gln	Ala	Glu
		435					440					445			
Leu	Asp	Pro	Leu	Met	Leu	Tyr	Arg	Tyr	Met	Arg	Arg	Gly	Asn	Pro	Ala
	450					455					460				
Pro	Phe	Gly	Ala	Tyr	Leu	Arg	Asn	Gly	Ser	Asp	Cys	Ile	Leu	Ser	Thr
465					470					475					480
Ser	Pro	Glu	Arg	Phe	Leu	Glu	Val	Asp	Gly	His	Gly	Thr	Ile	Gln	Thr
				485					490					495	
Lys	Pro	Ile	Lys	Gly	Thr	Cys	Arg	Arg	Ala	Glu	Asp	Pro	Gln	Leu	Asp
			500					505					510		
Arg	Asn	Leu	Ala	Met	Arg	Leu	Ala	Ala	Ser	Glu	Lys	Asp	Arg	Ala	Glu
		515				520						525			
Asn	Leu	Met	Ile	Val	Asp	Leu	Met	Arg	Asn	Asp	Leu	Ser	Arg	Val	Ala
	530					535					540				
Val	Pro	Gly	Ser	Val	Thr	Val	Pro	Lys	Leu	Met	Asp	Ile	Glu	Ser	Tyr
545					550					555					560
Lys	Thr	Val	His	Gln	Met	Val	Ser	Thr	Val	Glu	Ala	Arg	Leu	Arg	Ala
				565					570					575	
Asp	Cys	Ser	Leu	Val	Asp	Leu	Leu	Lys	Ala	Val	Phe	Pro	Gly	Gly	Ser
			580					585					590		
Ile	Thr	Gly	Ala	Pro	Lys	Leu	Arg	Ser	Met	Glu	Ile	Ile	Asp	Gly	Leu
		595					600					605			
Glu	Asn	Ala	Pro	Arg	Gly	Val	Tyr	Cys	Gly	Ser	Ile	Gly	Tyr	Leu	Gly
	610					615					620				
Tyr	Asn	Cys	Val	Ala	Asp	Leu	Asn	Ile	Ala	Ile	Arg	Ser	Leu	Ser	Tyr
625					630					635					640
Asp	Gly	Gln	Glu	Ile	Arg	Phe	Gly	Ala	Gly	Gly	Ala	Ile	Thr	Phe	Leu
				645					650					655	
Ser	Asp	Pro	Gln	Asp	Glu	Phe	Asp	Glu	Val	Leu	Leu	Lys	Ala	Glu	Ala
			660					665					670		
Ile	Leu	Lys	Pro	Ile	Trp	His	Tyr	Leu	His	Ala	Pro	Asn	Thr	Pro	Leu
		675					680					685			

His Tyr Glu Leu Arg Glu Asp Lys Leu Leu Leu Ala Glu His Cys Val  
 690 695 700

Ser Glu Met Pro Ala Arg Gln Ala Phe Ile Glu Pro  
 705 710 715

<210> 43  
 <211> 137  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 43

Met Arg Pro Pro Arg Leu Arg Ala Asn Gln Asp Gly Leu Leu Met Asp  
 1 5 10 15

Thr Ala Gly Arg Val Val Glu Gly Cys Thr Ser Asn Leu Phe Leu Val  
 20 25 30

Glu Asn Gly His Leu Val Thr Pro Asp Leu Gly Val Ala Gly Val Ser  
 35 40 45

Gly Ile Met Arg Gly Arg Val Ile Glu Tyr Gly Arg Gln His Gly Leu  
 50 55 60

Ala Cys Ala Val Lys His Val Tyr Pro Asp Gln Leu Val Arg Ala Gln  
 65 70 75 80

Glu Val Phe Leu Thr Asn Ala Val Phe Gly Ile Leu Leu Val Arg Ser  
 85 90 95

Ile Asp Ala His Ser Tyr Arg Ile Asp Pro Val Thr Leu Arg Leu Leu  
 100 105 110

Asp Ala Leu Cys Gln Gly Val Tyr Phe Thr Glu Arg Ser Leu His Gln  
 115 120 125

Val Ser Thr His Ala Gly Gln Asp Pro  
 130 135

<210> 44  
 <211> 200  
 <212> PRT  
 <213> Xanthomonas albilineans

<400> 44

Met Pro Ala Lys Thr Leu Glu Ser Lys Asp Tyr Cys Gly Glu Ser Phe  
 1 5 10 15

Val Ser Glu Asp Arg Ser Gly Gln Ser Leu Glu Ser Ile Arg Phe Glu  
 20 25 30

Asp Cys Thr Phe Arg Gln Cys Asn Phe Thr Glu Ala Glu Leu Asn Arg  
 35 40 45

Cys Lys Phe Arg Glu Cys Glu Phe Val Asp Cys Asn Leu Ser Leu Ile  
 50 55 60

Ser Ile Pro Gln Thr Ser Phe Met Glu Val Arg Phe Val Asp Cys Lys

<210>	45
<211>	202
<212>	PRT
<213>	Xanthomonas albilineans

Met 1	His	Pro	Pro	Ser 5	Pro	Leu	Asn	Thr	Gln 10	Gln	Lys	Asp	Trp	Leu 15	Thr
Arg	Gly	Gly	Ser 20	Leu	Thr	Ala	His	Leu 25	Arg	Leu	Leu	Gly	Gln 30	Val	Gln
Val	Gln	Val 35	Gln	Arg	Glu	His	Lys 40	Ser	Met	Ala	Trp	Leu 45	Asp	Glu	Tyr
Arg	Val 50	Leu	Gly	Leu	Ser	Arg 55	Cys	Leu	Leu	Val	Trp 60	Val	Arg	Glu	Val
Val 65	Leu	Val	Val	Asp	Ala 70	Lys	Pro	Tyr	Val	Tyr 75	Ala	Arg	Ser	Leu	Thr 80
Pro	Leu	Thr	Ala	Ser 85	Tyr	Asn	Ala	Trp	Gln 90	Ala	Val	Arg	Ser	Ile 95	Gly
Ser	Arg	Pro	Leu 100	Ala	Asp	Leu	Leu	Phe 105	Arg	Asp	Arg	Ser	Val 110	Leu	Arg
Ser	Ala	Leu 115	Ala	Ser	Arg	Arg	Ile 120	Thr	Ala	Gln	His	Pro 125	Leu	His	Arg
Arg	Ala 130	Cys	Asn	Phe	Val	Ala 135	Gln	Ser	His	Ala	Thr 140	Gln	Ala	Leu	Leu

Ala Arg Arg Ser Val Phe Thr Arg Gln Gly Ala Pro Leu Leu Ile Thr  
 145 150 155 160

Glu Cys Met Leu Pro Ala Leu Trp Ala Thr Leu Glu Pro Val Ala Ala  
 165 170 175

Pro Arg Gln Ala Ser Leu Ser Ala Asp Gly Pro Cys Arg His Ser Ala  
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Gln Ile Val Ser Pro Glu Ser Met Leu Glu  
 195 200

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Gln Ala Met Asn Pro Gly Leu Pro Ser Val Gly Gly Leu Ser Ala Gly  
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Gln Pro Leu Gln Leu Ser Leu Ala Pro Glu Leu Gln Ala Ala Ala Arg  
 35 40 45

Ser Ala His Arg His Leu Leu Asp Asp Gly Thr Ala Leu Tyr Leu Leu  
 50 55 60

Ala Phe Asp Thr Ala Gln Phe Asp Pro Gly Ala Phe Ala Ala Met Ala  
 65 70 75 80

Ile Ala Arg Pro Asp Ser Ile Ala Arg Ser Val Arg Lys Arg Gln Ala  
 85 90 95

Glu Phe Leu Phe Gly Arg Leu Ala Ala Arg Leu Ala Leu Gln Glu Val  
 100 105 110

Leu Gly Pro Ala Gln Ala Gln Ala Asp Ile Ala Ile Gly Ala Thr Arg  
 115 120 125

Ala Pro Cys Trp Pro Ala Gly Ser Leu Gly Ser Ile Ser His Cys Glu  
 130 135 140

Asp Tyr Ala Ala Ala Ile Ala Met Ala Ala Gly Thr Arg His Gly Val  
 145 150 155 160

Gly Ile Asp Leu Glu Arg Pro Ile Thr Pro Ala Ala Arg Ala Ala Leu  
 165 170 175

Leu Ser Ile Ala Ile Asp Ala Asp Glu Ala Ala Arg Leu Ala Lys Ala  
 180 185 190

Ala Asp Ala Gln Trp Pro Gln Asp Leu Leu Leu Thr Ala Leu Phe Ser  
 195 200 205

Ala Lys Glu Ser Leu Phe Lys Ala Ala Tyr Ser Ala Val Gly Arg Tyr  
 210 215 220

Phe Asp Phe Ser Ala Ala Arg Leu Cys Gly Ile Asp Leu Ala Arg Gln  
 225 230 235 240

Cys Leu His Leu Arg Leu Thr Glu Thr Leu Cys Ala Gln Phe Val Ala  
 245 250 255

Gly Gln Val Cys Glu Val Gly Phe Ala Arg Leu Pro Pro Asp Leu Val  
 260 265 270

Leu Thr His Tyr Ala Trp  
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Met Ser Val Glu Thr Gln Lys Glu Thr Leu Gly Phe Gln Thr Glu Val  
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Lys Gln Leu Leu Gln Leu Met Ile His Ser Leu Tyr Ser Asn Lys Glu  
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Ile Phe Leu Arg Glu Leu Ile Ser Asn Ala Ser Asp Ala Ala Asp Lys  
 35 40 45

Leu Arg Phe Glu Ala Leu Val Lys Pro Glu Leu Leu Asp Gly Asp Ala  
 50 55 60

Gln Leu Arg Ile Arg Ile Gly Phe Asp Lys Asp Ala Gly Thr Val Thr  
 65 70 75 80

Ile Asp Asp Asn Gly Ile Gly Met Ser Arg Glu Glu Ile Val Ala His  
 85 90 95

Leu Gly Thr Ile Ala Lys Ser Gly Thr Ser Asp Phe Leu Lys His Leu  
 100 105 110

Ser Gly Asp Gln Lys Lys Asp Ser His Leu Ile Gly Gln Phe Gly Val  
 115 120 125

Gly Phe Tyr Ser Ala Phe Ile Val Ala Asp Gln Val Asp Val Tyr Ser  
 130 135 140

Arg Arg Ala Gly Leu Pro Ala Ser Asp Gly Val His Trp Ser Ser Arg  
 145 150 155 160

Gly Glu Gly Glu Phe Glu Val Ala Thr Ile Asp Lys Pro Glu Arg Gly  
 165 170 175

Thr Arg Ile Val Leu His Leu Lys Glu Glu Glu Lys Gly Phe Ala Asp  
 180 185 190

Gly Trp Lys Leu Arg Ser Ile Val Arg Lys Tyr Ser Asp His Ile Ala  
 195 200 205

Leu Pro Ile Glu Leu Ile Lys Glu His Tyr Gly Glu Asp Lys Asp Lys

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Pro	Glu	Thr	Pro	Glu	Trp	Glu	Thr	Val	Asn	Arg	Ala	Ser	Ala	Leu	Trp
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Thr	Arg	Pro	Arg	Thr	Glu	Ile	Lys	Asp	Glu	Glu	Tyr	Gln	Glu	Leu	Tyr
				245					250					255	
Lys	His	Ile	Ala	His	Asp	His	Glu	Asn	Pro	Val	Ala	Trp	Ser	His	Asn
			260					265					270		
Lys	Val	Glu	Gly	Lys	Leu	Glu	Tyr	Thr	Ser	Leu	Leu	Tyr	Leu	Pro	Gly
		275					280					285			
Arg	Ala	Pro	Phe	Asp	Leu	Tyr	Gln	Arg	Asp	Ala	Ser	Arg	Gly	Leu	Lys
		290				295					300				
Leu	Tyr	Val	Gln	Arg	Val	Phe	Ile	Met	Asp	Gln	Ala	Asp	Gln	Phe	Leu
305					310					315					320
Pro	Leu	Tyr	Leu	Arg	Phe	Ile	Lys	Gly	Ile	Val	Asp	Ser	Ser	Asp	Leu
				325					330					335	
Pro	Leu	Asn	Val	Ser	Arg	Glu	Ile	Leu	Gln	Ser	Gly	Pro	Val	Ile	Asp
			340					345					350		
Ser	Met	Lys	Ser	Ala	Leu	Thr	Lys	Arg	Ala	Leu	Asp	Met	Leu	Glu	Lys
		355					360					365			
Leu	Ala	Lys	Asp	Asp	Pro	Glu	Arg	Tyr	Lys	Gly	Val	Trp	Lys	Asn	Phe
	370					375					380				
Gly	Gln	Val	Leu	Lys	Glu	Gly	Pro	Ala	Gln	Asp	Phe	Gly	Asn	Arg	Glu
385					390					395					400
Lys	Ile	Ala	Gly	Leu	Leu	Arg	Phe	Ala	Ser	Thr	His	Ser	Gly	Asp	Asp
			405						410					415	
Ala	Gln	Asn	Val	Ser	Leu	Ala	Asp	Tyr	Val	Ala	Arg	Met	Lys	Asp	Gly
			420					425					430		
Gln	Asp	Lys	Leu	Tyr	Tyr	Leu	Thr	Gly	Glu	Ser	Tyr	Ala	Gln	Ile	Lys
		435					440					445			
Asp	Ser	Pro	His	Leu	Glu	Val	Phe	Arg	Lys	Lys	Gly	Ile	Glu	Val	Leu
		450				455					460				
Leu	Leu	Thr	Asp	Arg	Ile	Asp	Glu	Trp	Leu	Met	Ser	Tyr	Leu	Thr	Glu
465					470					475					480
Phe	Asp	Ser	Lys	Ser	Phe	Val	Asp	Val	Ala	Arg	Gly	Asp	Leu	Asp	Leu
				485					490					495	
Gly	Lys	Leu	Asp	Ser	Glu	Glu	Glu	Lys	Gln	Ala	Gln	Glu	Glu	Ala	Ala
			500					505					510		
Lys	Ala	Lys	Gln	Gly	Leu	Ala	Glu	Arg	Ile	Gln	Gln	Val	Leu	Lys	Asp
		515					520					525			
Glu	Val	Ala	Glu	Val	Arg	Val	Ser	His	Arg	Leu	Thr	Asp	Ser	Pro	Ala
		530				535					540				



Ile Leu Ala Ile Gly Gln Gly Asp Met Gly Leu Gln Met Arg Gln Ile  
 545 550 555 560  
 Leu Glu Ala Ser Gly Gln Lys Leu Pro Glu Ser Lys Pro Val Phe Glu  
 565 570 575  
 Phe Asn Pro Ala His Pro Leu Ile Glu Lys Leu Asp Ala Glu Pro Asp  
 580 585 590  
 Val Asp Arg Phe Gly Asp Leu Ala Arg Val Leu Phe Asp Gln Ala Ala  
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 Leu Ala Ala Gly Asp Ser Leu Lys Asp Pro Ala Ala Tyr Val Arg Arg  
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cgttgaggat gcagcgctcg

20.